DETERMINANTS OFMARKET EFFICIENCY OF ETHIOPIAN COMMODITY EXCHANGE: THE CASE OF SESAME TRADE

By

Mekdes Kassaye

A Thesis Submitted to the School of Commerce Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Masters of Arts in Marketing Management

Advisor

Mesfin Workineh (PhD)

June, 2019

Addis Ababa

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

DEPARTMENT OF MARKETING MANAGEMENT

POST GRADUATE PROGRAM

DETERMINANTS OFMARKET EFFICIENCY OF ETHIOPIAN COMMODITY EXCHANGE: THE CASE OF SESAME TRADE

By

Mekdes Kassaye

Approved by Board of Examiners

_____	_____	_____
Advisor	**Signature**	**Date**
_____	_____	_____
Internal Examiner	**Signature**	**Date**
_____	_____	_____
External Examiner	**Signature**	**Date**
_____	_____	_____
Department Head	**Signature**	**Date**

Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university and that all sources of materials used for the thesis have been duly acknowledged.

Declared by:

Name:_____

Signature: _____

Date: _____

Confirmed by Advisor:

Name: _____

Signature: _____

Date: _____

Acknowledgements

Great honor and grace for God. I would like to express my gratitude to my advisor Dr. Mesfin Workineh for the useful comments, remarks and engagement through the learning process of this thesis. I would also like to give my great appreciation to all my family members and friends who have supporting me from the starting of the research and make it to this very point of my life. My heartily thanks goes to all ECX staffs that have in one way or another helped me to accomplish this study. I would like to extend my acknowledgement to all people who provide me with assistance and advice for their contribution on best findings of this thesis.

Table of contents

List of table

List of figure

Abstract

The Ethiopian commodity exchange (ECX) is the one and only modern market in Ethiopia that launched trading operation in April 2008, with contracts traded in coffee, sesame, maize, wheat & beans. The ECX market plays a vital role in Ethiopian economy. It is a leading market place where buyers and sellers come together to trade, assured of quality, delivery & payment. Efficiency is one of cost benefits analysis measurement tools that are used to determine by some factors. Among the determinants, marketing risk, marketing cost, product quality, information transmission media, transaction risk, payment method and market efficiency has been used for this study. The researcher has tried to find out if the above mentioned factors really determine market efficiency. The purpose of this paper is to explore the determinants of market efficiency in this commodity market specific to sesame trade. In order to address its objectives, the research has generally set conceptual framework. This study used both primary and secondary sources of data. It employed explanatory type of research. The target population of the study are employees and traders of ECX. Measuring of data in the realm of qualitative and quantitative research methods, questionnaire and interview data analysis have been employed respectively which was analyzed using SPSS. In addition, simple random sampling has been used to analyze data collected through questionnaires of ECX employees and for confirmation purpose, 10 market actors (in this case traders) have been involved in the study through interview questions.

The finding of the study shows that there is a direct relationship between the variables. All of them are found to be the determinants of market efficiency. The researcher recommended ECX to collaborate with supportive institutions like Ethio-Telecom, and also to work with the concerned stakeholders. It is also advisable to share experiences of other successful countries in commodity market.

***Keywords**: Commodity exchange, ECX*
Statistical Package for Social Science, SPSS

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Market efficiency can be considered as pre-requisite for prompt delivery of goods. Prompt delivery of good at a reasonable price is possible only if the market works in a competitive way. Competitive mechanism is possible only when the market agents are free to exercise their actions. An efficient marketing system implies that price spread or marketing margin is fairly less.

Experts have viewed the concept of marketing efficiency in different ways. As per their explanation, Maximization of input output ratio is a resemblance of marketing efficiency. Competition or effective market structure has also been discussed as an indicator of marketing efficiency and Lower price spread or marketing margin as a condition of marketing efficiency

Coming to commodity exchange markets, market efficiency is ensured through use of information technology to automate the End-to-End system from warehousing to trading to clearing and settlement of payments to delivery of commodity, and through a centralized trading platform offering low-cost service to all market users.

A **commodity exchange** is a central marketplace where sellers and buyers meet to transact in an organized fashion, with certain clearly specified and transparent rules of the game. Ethiopia Commodity Exchange (ECX) was established in April 2008. The objective for the establishment of ECX was Commitment to free market principles which the existing government has as its major agenda is aimed to be a problem solving tactic.On the other hand a floor for buyers and sellers is prepared to exercise reliability to one another in the trade connection.

Market information would be easier to share under an organized and supervised marketing system. And hence the establishment of ECX was initiated and encouraged in order to level the playing field.

Additionally, Efficiency in discovering market prices was the other objective for the establishment of ECX.Farmers' empowerment, the basis for production increase and fair income distribution alsoneeds an organization like ECX to come into reality.

Sesame:

Sesame (Sesamumindicum) is a flowering plant in the genus Sesamum. Many varieties of sesame exist in the world. It is widely cultivated in tropical regions and is cultivated for its vast consumption purpose. It is said to be the oldest crop known to mankind found and cultivated some 5000 years ago. Sesame is drought-tolerant. It has been called a survivor crop, with an ability to grow where most crops fail. Sesame has the highest oil content of all other oil seed of its type. Sesame, like other nuts and foods, can trigger allergy reactions in some people. (Kassa Yitbarek, 2015).

Reviewing the historical background of sesame marketing, previous researchers found out that there has been a long up and downs in the journey towards modernization of the Ethiopian grain market. Likewise, the story is the same for most African countries. Before the current reforms took place there has been serious problems in the sector such as: High contract default, Unreliable supply, Volatile prices, Poor quality, Unreliable trading practices, Poor information, Unregulated actors, Uncoordinated markets, High costs, high risks (Kassa Yitbarek, 2015).

With all above points fulfilled, the question of quality in production and service could be practiced through an organ like ECX. Contract risk was the major setbacks of the previous marketing system. To avoid contract default there should have been some one responsible and authorized to regulate the flow of the process and establish a formal procedure which would straighten buyer-seller business relationship. That is why ECX is established. (ECX, 2008)

The Ethiopia Commodity Exchange (ECX) is a new initiative for Ethiopia and the first of its kind in Africa. The scope of the ECX is to promote the commercialization of major agricultural commodities, such as grains, pulses and coffee.

Even though the commodity exchange has been operational since May 2008, sesame has not been traded by then. This is mainly due to the seasonality of the production and marketing. The critical period for sesame sales and purchases is in the months of November, December, and

January. Eventually Sesame is being traded on the ECX. There are 24 classifications and delivery centers. Some popular contracts include:

1. Whitish Humera/Gonder
2. Mixed Humera/Gonder
3. Whitish Wollega
4. Mixed Wollega

(Dawit Alemu& Gerdien Meijerink, cited in Ethiopia 2010)

Buyers and sellers now have access to standardized contracts that include details regarding the grade of the commodity, delivery location, and size of the lot that is being traded. The contracts allow traders to coordinate with each other more effectively.

1.2. Statement of the problem

As the recommendations from studies on the impact of the market reform stressed, the institutional solution to the problem has to go beyond mere establishment of the institution to its efficient working. Accordingly, ECX has envisioned to bring efficiency to the market and adopted localized commodity exchange with high profile staffs on board to achieve it. Thus, such study of market efficiency can supplement the achievement of the main goal for the institution's existence.

The main agricultural products passing through ECX for export are coffee and sesame.According to different literatures, market efficiency is ensured through use of information technology to ensure automated end to end system from warehousing to trading to clearing & settlement of payments to delivery of commodity and also through a centralized trading platform offering low-cost service to all market users.

However, sesame trade in ECX is facing difficulties that it cannot ensure market efficiency. In this regard researchers like Worku HA (2014)&Mohammed Ahmed (2015)found out that quality grade were the top challenge of ECX for the member. It is followed by storage/warehouse and marketing information respectively. Therefore, it is possible to conclude that quality grade and warehouse related problems were the main challenges of ECX for the members. As overall analysis revealed that higher transaction cost, price fluctuation, difficulty of network access,

expensive membership seat fee and exposed and non-transparent quality grading and sampling system of the exchange, bias, corruption were found to be amongst the forefront bottlenecks/constraints to the development and success of ECX. These researches have been done using descriptive research method.

Therefore in this paper the researcher goes beyond descriptions and attempted to explain the reasons for the phenomenon that the descriptive study only observed and investigated the determinants of its market efficiency while trading sesame. Therefore, the study tried to measure the level of efficiency with different determinant factors that exhibit varying degree of efficiency.

Following similar works, this study investigated if all the listed problems in previous literatures are still the challenges of Ethiopian commodity exchange currently.

1.3. Research question

1.3.1. Main research question

What are the determinants of market efficiency of ECX in sesame trading?

1.3.2. Sub research question

1. Does ECX offer low cost service to all market users?
2. How does the grading system of sesame affect efficiency of ECX?
3. Does default risk affect market efficiency of ECX?
4. What type of technology does ECX use to clear up payment to the seller?
5. How is the market information transmitted to market actors?
6. How does the ECX regulation affect its efficiency?

1.4. Objective of the study

The general objective of this thesis is to determine the market efficiency of ECX specific to sesame product. To this end, the study has the following specific objectives:

1. To investigate if ECX offers low cost service to all market users.
2. To evaluate the grading system of sesame in ECX.

3. To explore if there is a significant default risk that can affect the market efficiency of ECX.
4. To test if ECX uses e-payment system.
5. To identify how market information is transmitted to market actors.
6. To understand the regulation system of ECX and find out if it hinders its efficiency.

1.5. Significance of the study

This thesis provides inputs to other researchers for further study. It is expected that the result of this paper will contribute to the management of ECX as it indicates the level of its efficiency on sesame trading and could guide to some solutions. Besides, working on this research was of a great experience for the researcher.

1.6. Scope of the study

The study confined to studying the determinants of market efficiency of ECX only on the sesame trading.The issue is so wide that it is difficult to increase the sample size for precision sake in order to reduce error margin because it will lose its justifiable range.

Even though there are different market actors in ECX other than employees and traders, so as to make the study manageable, the research focused on key respondents of ECX employees only. For the same reason, the scope of the study was delimited in the ECX head quarter in Addis Ababa. Besides, all the determinants that could affect market efficiency are not exhaustively addressed. Rather, it was focused on the most important variables that are mentioned in the conceptual framework.

1.7. Limitation of the study

As the researcher is using explanatory research method, it can be difficult to reach appropriate conclusions on the basis of causal research findings. This is due to the impact of a wide range of factors and variables in social environment. In other words, while casualty can be inferred, it cannot be proved with a high level of certainty.

Besides, in certain cases, while correlation between two variables can be effectively established; identifying which variable is a cause and which one is the impact can be a difficult task to accomplish.

The study has got limitations for not taking all the population which are members of ECX as well as all the market actors. Hence, both the sample and area coverage was limited on specific employees and the geographical location is restricted in Addis Ababa.

Besides, the study is delimited to only focus on sesame (oil seeds) transaction at ECX. The issue is so wide that it is difficult to increase the sample size for precision sake in order to reduce error margin because it will lose its justifiable range.

1.8. Definition of Terms

Some conceptual terms will be defined as follows.

- ECX: - Ethiopia Commodity Exchange
- Commodity: - Agricultural product for sell at ECX, coffee sesame maize, wheat bean
- Member:- An individual or group who has got a sit at ECX
- Price: - An exchange bid price for a commodity at ECX
- Actors: - These are the participants in the market platform.

1.9. Organization of the study

The thesis is organized as follows: the first chapter is an introductory part. The second chapter reviews theoretical and empirical works in market efficiency of Ethiopia commodity literatures. The third chapter deals with the research methodology including the data type and sources used in the thesis. The forth chapter reviews the data analysis. The final fifth chapter is devoted to conclusion and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

In this chapter, an attempt was made to touch up on theories, concepts & notions that are related to the issue at hand. Besides, the discussion of terminologies and review of various literatures would be explored.

2.1. Theoretical Literature

2.1.1. The Concept of Efficiency

Forwarding a single definition of efficiency is not a simple task. The concept of efficiency has been used in different perspectives. It has been used from consumers' perspective, producers' perspective, market perspective and economic perspective. (Mas-Colellet'al, 1990) stated that the issue of efficiency captured a great deal of the focus of welfare economics. This can generally indicate what is meant by efficiency when it is used in either of the perspectives. It can also be deducted that efficiency has something to do with welfare enhancement.

The use of efficiency in consumers' and producers' perspective refers to maximization of consumer and producer surpluses as a measure of welfare gain by the two economic agents respectively. Unregulated competitive markets, except in the presence of externalities and market failure, always end up with such welfare enhancing efficient outcomes. When consumers' and producers' welfare are aggregated, it gives us economic efficiency (Pindyck & Rubinfeld, 1995).

The discussions in most microeconomics theory books tend to measure efficiency in terms of the outcome than on the process. This attributes seem to deliver a misleading conception of market efficiency in economic literatures like by (Preston & Collins, 1966). As the focus of this paper is market efficiency we will be engaged more on it than the other perspectives of efficiency.

2.1.2. Defining Market Efficiency

It is difficult to get a single definition of market efficiency that may hold for all markets. Even within the same market, different authors use different definitions. Ratchfordet'al (1996, p. 168) forwarded a concise definition of market efficiency that they have deducted from the studies they reviewed. They defined it in terms of the "actual or potential losses to individual consumers, which results from imperfect information about alternatives: An inefficient market is one in which such losses are or can be large." This definition seems to focus on the end results than the process in the market. Preston & Collins (1966, p. 155) on the other hand forwarded a definition that emphasizes the process in the market than the end results as "the facility and effectiveness with which the potential exchanges are accomplished". As the authors themselves admit, their definition is divorced from the specific characteristics of the quality and volume of goods and services being traded and the trading prices used in the exchange process. Though the discussion in this old work was interesting and informative, they seem to overlook the price formation process that most studies in commodity and financial markets extensively apply in their study of market efficiency.

The most widely used definition of an efficient market was given by Fama (1970, p.383) in which he stated that "*A market in which prices always "fully reflect" available information iscalled "efficient"*". Some authors, among others, like Kaminsky & Kumar (1996) and Washburn & Binkley (1990) prefer to call such efficiency as "*informational efficiency*". The use of efficiency in this sense is quite different from its use in the notion of Pareto efficiency (Ross, 1987, cited in Kaminsky& Kumar, 1996) and efficiency of a market in the informational sense does not guarantee Pareto efficient allocation of resources (Lundholm, 1991).

Besides informational efficiency, Blake (1990, p243) introduced operational efficiency and allocative efficiency to characterize a perfectly efficient market. In a competitive economy markets are said to be allocatively efficient if they "*allocate scarce resources between competing ends in a way that leads to the scarce resources being used most productively*" and operational efficiency is said to exist "*when the transaction costs of operating in the market (namely, the market-maker's spread and the broker's commission) are determined competitively*". For Blake, it is when these three types of efficiency are fulfilled we say that the market is perfectly efficient market. The author attributes the Fama's definition of an efficient market to represent what is

known in literatures as the "Efficient Market Hypothesis". Eugene Fama himself admitted that his definitional statement needs to specify in more detail the process of price formation in order to make the too general definitional statements a testable model. Beaver (1981, p23) belittled the difficulty to make the definitional statement a testable model as "a pervasive phenomenon not unique to the efficient market literature". Beaver argued that the fact that empirical investigations preceded the development of theories of market efficiency "make the widely cited definitions of market efficiency conceptually incomplete and deficient in a fundamental sense" (p23). The efficient market framework is also criticized for inconsistency with some forecasting techniques usually used in economics and the validity of the hypothesis, thus, can only stand on the cost of the effectiveness of these techniques (Laffer & Ranson, 1978). In addition to this, after recognizing Fama's work to be influential Malkiel (2003) documented a challenge to the hypothesis from economist who stress behavioral and psychological elements especially in the capital market. Answering all these critics induces the need to discuss the concept of market efficiency from its grass root.

"Efficient markets" are defined as markets in which asset prices always fully and instantaneously reflect all available information (Fama, 1970, p. 383). This is the strong form version of the "market efficiency hypothesis". Related to this definition is the notion of the efficient market hypothesis. The hypothesis describes an efficient market as one which consistently incorporates all information in determining prices. The three well-known assumptions of the hypothesis are:

(1) That there is no transaction cost;

(2) Information is costless available to all market participants; and

(3) The implications of current information for both the current price and distributions of future prices are accepted by all market participants (Fama, 1970, p. 389).

The implication of these assumptions is that, over the long run, no trader would earn more than average profits irrespective of the position or trading rule used in the market. In other words, if the markets are efficient, commodity prices do not follow any systematic pattern that could be the basis for excess profits.

2.1.3. Development in Market Efficiency Theories

In the areas of market efficiency, empirical works had preceded the development in the theory side (Fama, 1970). The foundation of market efficiency concept is attributed to Bachelier (1900) who had first recognized the informational efficiency of a market in his statement after a close observation of commodity prices series saying "past, present and even discounted future events are reflected in market price, but often show no apparent relation to price changes" (cited in Dimson & Mussavian, 1998, p91-92). The same randomness in prices was also observed on US stock prices and other economic time series by Working (1934) and Cowles & Jones (1937) both cited in Ibid).

Economists being faced with accumulated strong empirical evidence, felt compelled to give some rationalization. Their attempt resulted in the theory of efficient markets explained in terms of random walks (Fama, 1970). Malkiel (2003) nicely forwarded the rationale behind the link between the efficiency of a market and the randomness of prices. Malkiel argued that in a situation where a market fully and immediately reflects existing information, the prices will become unpredictable and random since news (information) by definition is unpredictable.

Tomorrow's price thus only reflects tomorrow's news and forecasting based on past information becomes a pointless task. After a review of large sum of existing works in market efficiency, Fama (1970) defines an efficient market to be a market that fully reflects available information.

To conclude the above analysis, the heart of the problem of economic order facing Ethiopia today is the central question of how market exchange can be coordinated efficiently at minimum transaction costs. Scholars have been analyzing the performance of the Ethiopian Commodity Exchange and figured out that the exchange market has failed to provide accurate and reliable market/marketing information at the right time and place to the traders. As a result, they are forced to sell their commodities without having adequate information related with price, demand, supply, and so forth. This factor, among other things, exposes traders to be confronted by formidable market a risk i.e. not to tap the market opportunities as it could and should be. To encapsulate, traders were less likely to obtain what they deserve from their trading practices. Lack of experienced expertise in the area is one of the main problems of traders to trade their commodities by having the deep analysis with respect to changes on the market structure, foreign

exchange rates, demand, supply, competition, and so on. Hence, in most often, traders were doing their business in rule of thumb.

As overall analysis of previous thesis revealed that higher transaction cost, price fluctuation, difficulty of network access, lack of adequate warehouses that accommodate ECX participants request poor recording and management system of the warehouses inefficient and inadequate in store credit; expensive membership seat fee and exposed and non-transparent quality grading and sampling system of the exchange, bias, corruption were found to be amongst the forefront bottlenecks/constraints to the development and success of ECX.

2.1.4. Efficient Settlements

Efficient settlements are an absolute essential for a successful exchange. Thus it is not only enough for ECX to provide efficient trading platforms but also since efficiency of settlement processes have a direct bearing on the ability of participants to effectively participate in ECX it is worthwhile to enhance efficiency of the settlement process.

To remove problems related with physical settlement it is better if ECX gives attention in enhancing efficiency in the physical settlement process flows. ECX's delivery notice is supported by the ware house receipt only but its is necessary if the warehouse receipt is accompanied by additional documents like documents verifying all the insurance is paid covering the delivery notice period of 10 days, to remove the difficulties that may arise during shipment date.

Besides efforts need to harmonize the actual physical settlement dates of different commodities, to increase the participation of professional arbitrageurs. To enhance the warehousing system of ECX there is a need for a central notification agency for standards and grades including sampling and testing techniques for agricultural commodities. It is also important that the standards developed must be closely aligned to commercial practice.

Most international commodity exchanges used certified warehouses (CWH) for the purpose of handling physical settlements. Such CWH are required to provide storage facilities for participants in the commodities markets and to certify the quantity and quality of the underlying commodity. If ECX also uses certified warehouses it gets many benefits. The most significant

benefit is that a warehouse receipt becomes good collateral, not just for settlement of exchange trades but for other purposes too.

To reduce the potential post shipment disputes or differences it is necessary for ECX to be get prepared by facilitating third party pre shipment verification service. Besides, making the electronic ware house receipts fungible in that a buyer should be able to take delivery at any branch of a warehouse at a cost and using warehouse receipt based settlement will result much greater churning and liquidity in the market.

2.1.5. Effective Risk Management

A variety of strategies exist for managing price risk. Physical strategies such as open position monitoring, marking to market, and back-to-back trading, can provide simple and effective reductions in risk exposure. Even placing forward contracts that can provide a flexible approach to managing price risk by offsetting an organization's open positions can be used. Contract farming is also a current trend in agricultural commodity production that reduces the price risks for both producers and processors.

2.2. Empirical review

2.2.1. Operation of ECX

ECX offers an end-to-end operation that includes warehousing, trading, clearing and settlement of payment, and delivery of commodity. ECX claims that its warehouse use state-of-the art grading and weighing equipment to sample, grade and weight commodities that it receives. The warehouse then issues an Electronic Good Received Note. These notes become negotiable, transferable or represent legal entitlement of the deposited commodity only when the Central Depository issues the bearer an Electronic Warehouse Receipt. ECX operates eight (three of them in Addis Ababa) large warehouses that are situated in major surplus regions of the country. These warehouses are presumed to have the maximum reasonable insurance coverage and use an inventory management system that meets global standards. Its inventory management system is believed to secure the quantity and quality of the commodities throughout the storage period.

ECX uses the might of modern information and communication technologies to create access to market information to all its actors including the general public. The Exchange uses rural based

Market Information Tickers, mobile phone Short Messaging Service (SMS), Interactive Voice Response (IVR) service, Mass media (TV, Radio, and Newspaper) and Website to disseminate market information. Market information on commodity prices in different markets and commodity offer to sell and bids to buy, and others are collected, processed, updated and disseminated to market actors. Price information on Electronic Tickers is updated in less than 4 seconds and market information through mass media is disseminated on daily basis (Abdurezak, 2010).

2.2.2. Membership of the Exchange

ECX is a membership based exchange. Any individual, private company, public enterprise, or cooperative that meets the membership requirement can be a member of the exchange. The membership requirement is detailed in article 4.6 of the Rules of the Ethiopian Commodity Exchange.

ECX provides two types of membership- Full and Limited membership. Full members own a permanent and transferable seat in the exchange. They can also trade in any commodity. A limited member, on the other hand, has a membership seat that lasts a year, trades only one commodity and has one position (either sell or buy).

A limited type of membership is created to accommodate smaller actors. All members who own a seat in the exchange are liable to their transaction and are required to follow the Rules of the Exchange. Within each type of membership there are two classes of membership- Trading Member (TM) and Intermediary Member (IM). TM trades only from his or her own account, whereas IM trades either from his or her account or on behalf of clients. Clients only work through intermediary members. Though the relationship between a member and a client is private, the exchange closely watches and regulates their interactions to safeguard the smooth functioning of the system. When a client decides to trade through a Member, the members submits a Member-Client Agreement (MCA) form to the Exchange. The Exchange sets a fee payment by a client to the member not to exceed 2% of the total value of the trade. In case of controversies, clients can bring their case to Exchange Arbitration Tribunal. Members of the exchange can also appoint an Authorized Representative (an individual employed as an agent or staff of a member) to trade on their behalf (Alemu D. & M. Gerdien, 2010).

Members and their Authorized Representatives are obliged to participate in the National Exchange Actors Association (NEAA). The Association has the responsibility ranging from building member capacity through training to public education and advocacy of the Exchange on behalf of the Actors.

2.2.3. The purpose of commodity exchanges

The purpose of a commodity exchange is to provide an organized marketplace in which members can freely buy and sell various commodities in which they have an interest/sake. The exchange itself does not operate for profit. It just provides the facilities and ground rules for its members to trade in commodity futures and spots and for non-members also to trade by dealing through a member broker and paying a brokerage commission.

The purposes served by a commodities exchange depend in part on the nature of the specific contracts that are traded. Just by centralizing trade in a commodity an exchange can facilitate title transfer, price discovery and market transparency. Transaction costs are decreased because coordination through a centralized exchange can decrease costs associated with identifying the market outlets, physically inspecting of the product quality, and finding purchaser or sellers.

By decreasing transactions costs and enhancing information flows an exchange can improve returns to market agents while reducing short term price variability and spatial price dispersion. Such contracts command little capacity to address inter annual price uncertainty.

More sophisticated contracts allowing exchange in futures can enable further risk management, but such contracts require a well-developed exchange and cannot address maintain spot prices in bounds that might be desired. Trading contracts for future delivery, commodity exchanges can assist strengthen market liquidity, increase profit, improve price discovery and facilitate price risk management. According to Rashid et al., an exchange can improve liquidity because a futures contract is a fungible financial instrument which buyers and sellers are willing to hold and exchange. While futures contracts efficiently remove price level risk, they do not eliminate the risk. Instead they replace price risk with basis risk, where the basis is the difference between the spot market and futures market prices. Unexpected shifts in the basis can result I losses or

gains, and the degree of basis risk can highly influence the effectiveness of the exchange in risk management.

As explained by Rashid et al., providing the services of a commodity exchange is expensive. The costs include physical investments in warehousing, operational space and communications as well as operational costs involved in screening participants and enforcing contracts. Moreover, an exchange typically must provide clearinghouse services which allow buying and selling the commodities traded at the stated prices with limited fear of default for participants. These services disclose the exchange to both working capital costs and risk. For an exchange to succeed its services must be adequately valued by users that they are willing to pay fees to cover these costs.

According to Rashid et al., market failures, including inadequacies in physical infrastructure, asymmetry in information, inadequate supporting legal and financial institutions can all impede the formation of futures exchanges.

2.2.4. Sesame production in Ethiopia

The main marketing season of Ethiopian sesame is from late November to early February. The production and marketing of sesame is concentrated in selected areas in Ethiopia following the production potential and tradition. The major sesame growing areas are located in the Northwest; in Humera area in Tigray near the border with Sudan and Eritrea; in Metema in North Gondar and in Wollo area of Amhara region, Chanka area in Wellega of Oromiya, and in Pawi area in Benshangul Gumuz region.

In general, farmers produce different varieties of sesame with white seed colour especially in Humera and Metema areas. For instance, in Metema areas, three types of sesame varieties i.e. Tej Arab, GojjamAzene and Hair-Hair are grown either solely or in combination. In terms of price linked with demand, the Humera type is much more demanded, followed by Metema and Wellega types. Commonly, sesame is threshed starting from early October to Mid November and the major marketing season starts from late November and end early February each year.

The major actors in the Ethiopian sesame market are exporters, wholesalers, brokers/agents, local traders (Assemblers), primary cooperatives and their unions, commercial farms and small scale farmers. A recent study conducted in Metema area revealed that about 34% of the production is directly purchased by wholesalers from the farmers, followed by assemblers (22%) and cooperatives (18%), which shows the important role of wholesalers, assemblers and cooperatives in the sesame market chain.

Because of the scattered and small-scale nature of the Ethiopian production system, the role of aggregation in improving the agricultural marketing system is emphasized in the national agricultural marketing strategy. Cooperatives and their respective unions are expected to play an important role in this. The two most important cooperative unions for sesame marketing are the Setit-Humera agricultural marketing union in Humera areas and Metema agricultural Marketing union.

The Metema cooperative union has six primary cooperatives under it. As in the other cooperative unions, the union is governed by the seven executive board members that are elected by the general assembly which is composed of nine delegated from each primary cooperative. The day to-day activities of the union are run by an employed manager based on the orders and decision of the executive board. In the production season 2007/08, the union was engaged in the purchase of sesame from member farmers through the primary cooperatives. It purchased more than 7000 quintals[2] with the price range of 1080 to 1300 birr/quintal.

Normally, cooperative unions receive support from regional cooperative promotion offices in the form of technical advice and provision of market information. The Amhara bureau of agriculture and rural development through its cooperative promotion office has been providing market information, taking into consideration the time of harvest of the Indian sesame and its impact on the international sesame market. The price offered to the union using the information provided by the coop promotion office was about 2650 birr/quintal (2860 USD /MT[3]). However, the cooperative union was not prompt enough to sell at that price and waited while the price in the domestic and the international market was declining rapidly, which forced the union to store the purchased sesame until the end of 2008. This implies the weak marketing skills and ability to understand the international market trends and behavior.

This shows the importance of a reliable market information system to provide up-to-date price information. In fact, sesame markets in Ethiopia sometimes show highly diverging prices, reflecting the fact that the sesame market cannot be assumed to be perfectly competitive.

2.2.5. A View of ECX from Within, Without

Figure 1: Ethiopia Commodity Exchange (ECX)

The former CEO of ECX Dr. EleniG/medhinsummarizes the importance of change In the Ethiopian Commodity Exchange, stating that:

> *'If change is inevitable, then let's embrace it, and seek it as a positive force of energy sweeping in with the times. And so it is with the nearly decade-old Ethiopia Commodity Exchange (ECX), still the first and only one of its kind in all of Africa. Change. Inevitable. Sparing nothing and no one.'*

The major concern, however, is the notion of implementing a system of selling on truck with bonded yards for trucks to be parked while trading is happening. Viewed from the outside, this is an idea that seems to be born out of the need to somehow address the current concerns and inefficiencies in the ECX warehouse receipting system. This notion risks injecting even more inefficiency and risk, with trucks that cannot remain immobile beyond a few days without

creating transport market constraints. It hardly resolves the issues around delays and fraud from manual sampling of commodities on truck, as well as grading and weighing of commodity.

According to Dr. Eleni, the solution to the ECX warehouse operations problem is not to get into on-truck transactions. But rather to open up the warehouse operation to highly specialized global and domestic warehouse operators-investors who would invest in global standard modern warehouse infrastructure including mechanized handling equipment; automated sampling off-truck; high-speed technical quality assessment; and digitized inventory tracking technology including laser beam stock measurement to ensure speed and accuracy of daily stock positions down to the kilogram, avoiding the current leakages of stock.

These modern technology-based inventory management systems are not remote and inaccessible. They are readily available and operable at low cost with high volume by private companies, even on the African continent as well as elsewhere not too far away, and can be attracted with the right investment incentives. Like all global exchanges, ECX is best served by getting out of the warehouse operations business altogether and focusing its efforts on what it does superbly. That is to operate an airtight trading system seamlessly integrated with its central depository, payments clearing and settlement, market data and continuously refining and expanding these systems.

Change. Nothing stays the same. ECX is a dynamic, living, organization. It has legacy, culture, and roots, but like anything living, it must grow, adapt, and move with the times. The resilience of its system that, day in and day out, continues to deliver a zero-default market that trades on an orderly and standardized basis, settles hundreds of millions of birr daily and transmits price data within seconds to all. It impacts the livelihoods of millions of farmers, processors, and exporters, is testament to the strength of its core that preserves ECX as a jewel in Ethiopia's crown, and as Africa's shining model of a modern technology-powered spot market that other countries still aspire to emulate.

ECX today has new opportunities it has yet to embrace. One such opportunity is the mobile revolution that is sweeping across Ethiopia, a very different picture today than twelve years ago when ECX was initially designed, and there was less than 6pc mobile penetration. Today, with

mobile penetration of above 50pc of the Ethiopian population, and smart phones now reaching 9 to 15 million users, online trading should not be on computer or, rather, computers should not be conceived as on top of a table in a room in a building, but anywhere and everywhere in the hands of tens of millions of mobile users.

Linked to this is the dramatic rise of mobile payment systems in Ethiopia that should be adapted and harnessed into the ECX clearing and settlement system that was a fantastic solution to the problems of yesterday, not of today. Finally, perhaps the biggest opportunity of all is to embrace the idea that it may now be time to devolve ECX ownership and inject new vision, new approaches, and new energy. This could be through partial or total ownership by private owners, such as key investors, the public at large, its own employees or a combination of the above, just as it was originally conceived after an initial proof of concept period of some five years.

As summarized by Dr. Eleni (2017):

> *'Everything must change. Nothing stays the same. Maybe the real challenge is that ECX must change more, not less.'*

2.2.6. Market Efficiency Tests

Johnson et'al (1990, p65) summarized the concerns of the type of tests used in futures market into three main areas:

a) Testing random walk on futures prices

b) Testing the efficiency of forecasting the spot price from its futures price, and

c) Testing the possibility of generating profit using trading rules

The test for random walk hypothesis using different statistical tools is widely used in the capital market than the commodity market. Solnik (1973) used the standard serial correlation test to study the behavior of daily closing prices of common stocks taken from 8 of the major European stock markets. Marashdeh and Shrestha (2008) studied the market efficiency of Emirates stock market using unit root test of Augmented Dickey Fuller (ADF) and Philip-Perron (PP). The PP and the Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) tests for unit root were also employed

by Mishra et'al (2009) to examine the weak form of market efficiency in the Indian stock market.

Unit root test are mostly parametric and they are thus valid only when the assumption of normality of the data distribution is guaranteed; most financial time series, however, violet the assumption of normality (Xin& Chen, 2006). A plausible alternative and widely used nonparametric test for random walk is the Lo-MacKinlay variance ratio test introduced by Lo and MacKinlay (1988). They first introduced the test in their study of random walk in market efficiency of the New York Stock Exchange. The same test was used by many studies including Tabak (2002) on the Brazilian and Lock (2007) on the Taiwan stock markets. A variant of the Lo-MacKinlay variance ratio test is the multiple variance ratio test; Smith et'al (2002) and Smith and Smith &Ryoo (2003) used it to test the weak form of market efficiency in 8 African stock market and 5 emerging European stock markets respectively. The problem with most of the tests for random walk (discussed above) is their inability in detecting non-linear dependencies in the time series. Using these non-linear dependencies traders in an exchange can devise profitable trading rules to earn excess return. This had been seen in the work of Leuthold (1972). Leuthold found a profitable trading rule after the market was declared to be weak form efficient using the spectacular analysis. Most financial return series appear often to look completely random to spectral and standard linear tests; and that using other powerful techniques may unveil more complex dependencies in the series which will ultimately lead to the refutation of the existence of a random walk process (Brooks, 1996 cited in Lim et'al, 2004). Fama (1970, p.394) has also noted that "Moreover, zero covariance are consistent with a fair game model, but as noted earlier, there are other types of nonlinear dependence that imply the existence of profitable trading systems, and yet do not imply nonzero serial covariance".

One of statistically powerful test to study such complex dependencies is Brock-Dechert-Scheinkman (BDS) test for random walk. Lim et'al (2004) used the BDS test to study market efficiency in eight major Asian stock markets. Another alternative way to test random walk in financial time series is the detection of predictability patterns in trading days. Along this line, Jarrett (2008) investigated market efficiency of the third largest exchange in Asia Pacific- the Hong Kong Exchanges. Jarrett tested the predictability in returns making daily returns as a dependent variable and using five dummy variables to represent the five trading days- Monday to

Friday- as independent variables. The test for weak form of market efficiency in commodity market is rarely done using the random walk theory. Much of the studies in commodity markets concentrate on testing the efficiency of forecasting the spot price from its futures price (applying the martingale model). In testing for random walk in commodity markets, among others, serial correlation test, runs test, unit root tests, variance ratio, spectral analysis, mechanical trading rules (filter techniques) were used. Still others used the combination of test on the same data set like Stevenson & Bear (1970) in soybeans and corn prices and Leuthold (1972) in live cattle future market. In commodity futures market the concept of co-integration was widely applied to test the relationship between futures prices and spot prices. The co-integration concept is expanded to apply what is known in literature as the "unbiasedness hypothesis" and "the BK hypothesis" in studying commodity futures market efficiency. The ARCH-M and GARCH-M models were also used in commodity futures markets to explain market efficiency. Unfortunately, the results in both capital and commodity market are as diverse as the methodology applied. The following sections make a full review of representative empirical works that employ the different methodological tools in studying market efficiency in commodity markets.

2.2.7. Risks faced by an exchange

As the business world is dynamic and is uncertain, there are risks that are to be managed by the business participants. As one part of the business exchanges too face different type of risks in their operation these includes: operational risks and market risks.

A. Operational risks

Operational Risk is risk of loss resulting from inadequate or failed internal processes, systems or people. (ECX, 2001) An operational risk is a risk arising from execution of a company's business functions. As such, it is a very broad concept including e.g. fraud risks, legal risks, physical or environmental risks, etc. The term operational risk is most commonly found in risk management programs of financial institutions that must organize their risk management program according to Basel II. In Basel II, risk management is divided into credit, market and operational risk management. In many cases, credit and market risks are handled through a company's financial department, whereas operational risk management is perhaps coordinated centrally but most commonly implemented in different operational units (e.g. the IT department takes care of

information risks, the HR department takes care of personnel risks, etc) More specifically, Basel II defines operational risk as the risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events. Although the risks apply to any organization in business, this particular way of framing risk management is of particular relevance to the banking regime where regulators are responsible for establishing safeguards to protect against systemic failure of the banking system and the economy. (Wikipedia, October, 2007)

Operational Risks- Warehousing

The operational risks related to warehousing include physical storage risks, Deterioration/Degradation, Infestation, Theft, Sampling, Grading and Inventory Management. (ECX, 2001).

Operational Risks- Trading

The operational risks related to trading include System Security, Order Entry, Telecommunications, Processes and System Failures. (ECX, 2001)

Operational Risk Identification

The operational risk identification method involves: Operational audits of all ECX units to identify current and potential risks, Operational performance reports and Strategy, design and market analysis. (ECX, 2001)

B. Market Risks

Market Risks are Risks to the integrity of the market due to foul play or negligence by participants or poor market design. (ECX, 2001). ECX Market Risks encompasses Trading Practice Violations, Market Manipulation, Fraud, Contract Design, and Member Settlement Default. (ECX, 2001). The basic market risk identification method in use is Market Surveillance. The specific things done during market surveillance are floor surveillance, trade activity report analysis, video surveillance, price movement monitoring, member audits and market analysis. (ECX, 2001)

Risk mitigation

Risk Mitigation at ECX is through Membership Standards, position limits, daily price limits, rules, Audits System Validations, role Based Application Security, insurance, system/Process Redundancies, training. (ECX, 2001).

2.2.8. Settlements

Efficient settlements are an absolute essential for a successful exchange. It is not enough to provide efficient trading platforms. Efficiency of settlement processes has a direct bearing on the ability of participants to effectively use commodity exchanges. Commodity settlement represents one of biggest challenges to NMCE. (T.S.J agadharini & Raghavan Putran).

How is the commodity settlement going in ECX?

The rest of the problem analysis part is mainly devoted to raising some of the key issues regarding the same. Final settlement can either be (a) cash settled or (b) settled though physical delivery if commodity derivatives have been used. But since ECX uses only spot trading there is only physical settlement.

- **Physical Settlement**

The issues faced in physical settlements are enormous. The quality of warehouses leaves much to be desired and the process of taking physical delivery is very cumbersome. This in itself is a major impediment to enhanced liquidity in the commodities markets as the link between an under developed spot price discovery mechanism and futures prices becomes even more tenuous preventing effective arbitrage in the future when commodity futures are introduced.

The process flows in the event of physical settlement of commodities are different from that of other underlying. It may therefore be worth outlining the process flow.

- **Delivery Notice Period**

The process starts when the exchange gives a delivery notice. The 'delivery notice period' (DNP) is ten days. Typically as in all commodity exchanges, delivery notice is required to be supported by a warehouse receipt. The warehouse receipt is the proof for the quantity and quality of commodities being delivered. Some of exchanges have certified laboratories for verifying the quality of goods. In these exchanges the seller has to produce a verification report from these

laboratories along with delivery notice. However currently in ECX sellers are not required to produce a verification report from independent laboratories. Besides, other necessary supportive documents which can add value to the settlement are not used.

However, involving other supportive documents is essential for the exchange. This is because that as the size and the volume of trading increases it is through those supportive documents that the exchange can create risk free settlement mechanisms. Though, warehouse receipts are ideally expected to represent without any problem the real quality and quantity of the commodities specified, it is necessary to involve other supportive documents for making settlements free of any risk of quantity and quality of goods delivered. This judgment is based up on the fact that though the exchange is one of the modern the participants needed to bring to that level and till then without supportive documents one will not be able to be fully entrusted on the receipts.

The gap between last notice day and last trading day will be driven by possible duration to inspect and take physical delivery. These factors need to be considered while deciding the settlement mechanism.

2.2.9. Delivery

After the deliver notice, clearing house/exchange issues a delivery order to the buyer. Exchange also informs the respective warehouse about the identity of the buyer. The buyer is required to deposit a certain percentage of the contract amount with the clearing house as margin against the warehouse receipt.

The period available for the buyer to take physical delivery is stipulated by the exchange. Buyer or his authorized representative in presence of seller or his representative takes the physical stocks against the delivery order. Proof of physical delivery having been affected is forwarded by the seller to the clearing house and the invoice amount is credited to the seller's account.

In the case of commodities the actual physical settlement dates is different for different commodities and there is no effort to harmonize them. This process of physical settlement also makes it difficult for professional arbitrageurs to fully participate.

2.2.10. Warehousing system

ECX implemented a settlement which has electronic links with designated clearing banks for efficient funds movements. Typically the exchange will require its members to open designated accounts with specified clearing banks. Such accounts will be used only for the purpose of settlements. The exchange will have the right to debit/credit such accounts directly through electronic interface with the clearing banks.

For the purpose of commodity settlements ECX entered into an arrangement with designated warehouses to handle settlements. If a physical settlement system is to be in operation it is better to have all open positions at the end of the contract to be settled through delivery.

The ability to settle commodities efficiently, of course, depends to a great extent upon the warehousing systems available. The effectiveness of ECX is dependent on how effectively the system of warehousing and warehouse receipts work.

The first requirement in this direction is to have good standards and quality assurance/certification procedures. A good system of grading allows commodities to be traded by specification.

Currently there are neither any various agencies that are responsible/specify grades for commodities nor any system of designated surveyors to inspect and certify delivery. Besides, there is no a central notification agency for standards and grades including sampling and testing techniques for agricultural commodities. This is an area where much work is required to be done to improve both standards and testing/certification methods. .

Lack of centralized standard specifying agencies for agricultural commodities including those exported create a hole in the grading and standardizing of commodities. If such a system was implemented, all instructions for physical delivery will be then required a quality certificate from approved surveyors. Which will in turn creates additional good feature to ECX.

Alternately, certified warehouses can issue quality certificates either using in−house labs or professionally licensed graders. Some exchanges like NYBOT use this method. Most international commodity exchanges used certified warehouses (CWH) for the purpose of

handling physical settlements. Such CWH are required to provide storage facilities for participants in the commodities markets and to certify the quantity and quality of the underlying commodity. Such a system has many benefits. The most significant benefit is that a warehouse receipt becomes good collateral, not just for settlement of exchange trades but for other purposes too.

But currently there are no certified warehouses. Therefore, the warehousing system is not adequate to meet the above mentioned requirement. Central and state government controlled warehouses are the major providers of agri−produce storage facilities. Apart from these, there is no private warehousing being maintained. Besides, there is no clear regulatory oversight of warehousing services. Contrast this with depositories, banks and custodians in the capital market world which are governed by explicit statutes. There is a lack of minimum standards in procedures, design and management of the warehouses.

Reliability and efficiency of the current set of warehouses are still to be established. Ideally it would be desirable that warehouses provide a performance guarantee assuring that the quantity/quality of goods on the receipts matches with those in the warehouse. If this is done the comfort level of participants to give/take delivery will increase significantly.

Even there are better warehouses in Ethiopia, not all locations are equal. There are some warehouse branches which are of much better quality than others. Some are minimal in their setup and quite clearly cannot meet the minimum requirements for exchange settlements. As a result ECX without having designated branches of certified warehouse which are acceptable cannot achieve its target. Moreover, in a nation−wide trading it is very difficult for a broker who is acting as a seller to arrange for delivery at designated warehouse branches. The tendency therefore will be to close out positions/cash settle the same when futures are introduced without performing these preliminary issues.

Third party pre−shipment verification services may also be used to ensure that the physical commodities settled are of the desired grade/specifications. While this will add to the overall cost of operations it will help significantly reduce potential post settlement disputes/differences. However this is not the practice in ECX that is there is no a third party pre shipment verification. Thus one significant practice is missing in ECX.

2.2.11. Risk Management

A key element of settlement and safety of the market is guaranteed settlements. This eliminates counterparty risk as exchange/clearing house becomes counterparty to transactions. The exchange/clearing house, besides providing clearing and settlement services, manages market risk and guarantees completion of settlements. This encourages wider participation by all sections of investors and traders. This requires effective risk management systems and a legal framework which supports the same. Currently ECX uses different tools to manage operational and market risks. To manage the market risks the main tools which are in use by the exchange are settlement guarantee fund, member audit, market analysis. But currently, the method which is mainly used is marker surveillance. This method enables the exchange manage its risk by identifying whether two specific parties are engaged in buying and selling only among themselves or are offering only specific prices that can manipulate the market (Haggblade S., 2001).

The current risk management of ECX did not cover adequately the scope and importance of the commodity price risk problem. Besides the risk management techniques(specially the mainly used market surveillance) fails to provide ways for assessing, monitoring, and managing the price risks faced by individual producers, producer groups, banks, trading companies, and other firms operating in commodity markets.

It is clearly known that as in most developing countries in Ethiopia too, production and marketing of primary commodities play a dominant role in the country's economies and unpredictable fluctuations in commodity prices cause various problems for actors throughout the supply chain. Clearly participants in the commodity supply chain are subject to financial risk due to both price risks and physical risks to harvest quantity and quality. A variety of strategies exist for managing price risk. Physical strategies such as open position monitoring, marking to market, and back-to-back trading, can provide simple and effective reductions in risk exposure. Even there are no forward contracts that can provide a flexible approach to managing price risk by offsetting an organization's open positions. Contract farming is a current trend in agricultural commodity production that reduces the price risks for both producers and processors. But for all these issues surrounding commodity risk and management solutions the ECX practice is silent.

The other perspective is the role of government in market-based price risk management. Currently the government of Ethiopia is doing nothing to alleviate the existing barrier to effective hedging; that is there is still lack of mechanisms to hedge an open position since futures, options, swaps and other derivatives are not allowed to be in place. Finally the government is not helping participants in the commodity supply chain implement hedging strategies by reducing key barriers related to lack of knowledge, scale of production, access to credit, basis risk, and legal and regulatory standards.

2.3. Overview of market efficiency and commodity exchange

2.3.1. Market Efficiency in Commodity Markets

Almost all organized commodity markets make futures trading and they are often termed as commodity futures market. Though the concept of market efficiency is often attached to asset market it has same applicability in commodity futures market (Kaminsky& Kumar, 1990). In studying the futures market efficiency, a random walk theory was tested on closing prices (Stevenson & Bear, 1970 and Leuthold, 1972) and on futures prices (Phukubje & Moholwa, 2006). Moreover, the expected return or the "fair game" hypothesis was used to study commodity futures market efficiency by Kaminsky& Kumar (1990) and co-integration analysis and its extended versions were used by Li et'al (2004) and others.

The Test for Random Walk Hypothesis in Commodity Markets Hoping to formulate a more meaningful statement about random walks in commodity futures market, Stevenson & Bear (1970) applied the serial correlation test, runs test and filter techniques covering the July contracts in the period 1957-1968 to check the randomness of 240 daily closing price differences in commodity futures markets. They took two of the largest traded commodities (in terms of volume and total open interest) on the Chicago Board of Trade namely Soybeans and Corn. The researchers used one day, two-days and five-days lag separately and found different results. In the one-day and two-day lag a negative correlation coefficient, that was more prevalent in soybeans than in corn, was observed. The rule that daily trading prices are based on previous day closing prices partly explain the phenomenon especially in soybean. The five-day lag on the other hand witnessed a greater positive bias in general and more prevalent in corn prices. The results from the runs test were also found to be consistent with the correlation coefficient results and the filter (mechanical trading rule) test. They concluded that prices in the commodity futures

market follow a systematic pattern (trend) than random walk. As to the implication of the study, the authors preferred to be cautious about the applicability of the efficient market hypothesis in commodity futures markets than to question the validity of the hypothesis itself.

Stevenson & Bears' conclusion is a setback to the application of the random walk hypothesis to test EMH in commodity futures market. Despite the use of different statistical tools the results seem to be the same. As noted in EMH literatures, the runs test and the serial correlation coefficient test are too unsophisticated to trace complex dependencies; yet the result of Stevenson& Bear goes against the null hypothesis that there is random walk. Leuthold (1972) tested random walk with a relatively complex statistical tool (discussed below); yet again the random walk theory fails to explain the price change consistently across the study period. Leuthold (1972) identified the failure to use different tests on an identical data as a possible explanation for the lack of consensus on any single result. The author acknowledges Stevenson & Bear's (1970) attempt to address the issue but he is critical of their use of unsophisticated statistical tools. Taking these shortcomings seriously, the study used a relatively sophisticated technique- namely spectral analysis- together with mechanical filters technique to verify the random walk hypothesis (and by implication the EMH) in live cattle markets.

Leuthold studied the daily closing prices of 30 live beef cattle futures contracts in the period April 1965 to February 1997. The study has included 6914 observation and approximately 230 observations per contract. The spectral analysis result showed that the price changes are in conformity with the random walk theory for only some part of the study period. The filter technique however uncovered that even in periods that the spectral analysis accepted randomness; there are possibilities of arranging profit generating trading rules. As the employed statistical test looks for linear dependency, the trading rules might have exploited the existence of non-linear dependencies to create such profitable trading arrangements. Leuthold called for more investigations and noted the need to formulate statistical techniques that can capture the type of price movements witnessed in the filter techniques. Both works discussed make us to be cautious about the use of random walk theory to explain market efficiency in commodity futures market. Similar to the stock market, efficiency studies in commodity markets also showed mixed results (Leuthold, 1972; Kaminsky& Kumar, 1990; He & Holt, 2004). The random walk hypothesis that was unable to hold in Leuthold (1972) & Stevenson & Bear (1970) papers was

found to hold in Kendall (1953cited in Fama, 1970), Larson (1960) and Cargill &Rausser (1969) both cited in Leuthod (1972) and many others.

2.3.2. Review of commodity market efficiency in other countries

Another new approach of studying market efficiency comes from Phukubje & Moholwal (2006). They investigated the South African futures market for wheat and sunflower seeds for the weak form of market efficiency. This work is a significant contribution to the very few existing similar studies that have tested the market's efficiency in white maize and yellow maize. The researchers departed from what they call the traditionally used spot and futures prices co-integration test to regressing current futures prices on past futures prices due to the lack of data on spot prices. They argued that "if the futures market is efficient, then past futures price changes should have no significant information for predicting current futures price changes". The study used daily settlement prices40 of the two commodities for the five contract termination months within the year 2000 to 2003. Ljung-Box Q-statistic is used to determine the optimal lag length that can keep the autocorrelation in the error term close to zero. To reduce computational errors, they scaled the log price differences by 100.

The F-test is used to test the joint null hypothesis of no predictability for the two crops. The results showed that the daily futures prices are partially predictable from past futures prices and implied the rejection of the weak form of the EMH. Using trading rules that accounts for the time value of money and brokerage costs, the paper has shown that the model cannot be exploited to make a profitable trade that implies that the weak form inefficiency has no strong support. The paper finally tested the stability of the results using the likelihood ratio test to check whether a trend exist towards efficiency. The result from the stability test revealed that the parameters are stable and there is no trend towards efficiency. Beyond their contribution to the limited studies available in the area, their methodological approach shows how to escape the lack of spot price data to study market efficiency. Their study has only tested the weak form of the EMH.

The following study demonstrates the test for both the weak and semi-strong forms of the EMH in commodity futures market. Kaminsky& Kumar (1990) employed simple averages and econometric regressions to test market efficiency in fairly large and diversified commodities. They centered their study on the implied premises of the "fair game" hypothesis that excess rate of return to speculation in commodity futures market should be zero.

They disaggregated the possible excess return into risk premium and forecasting error components. A data of eight commodities in the time period 1976 to 1980 from different sources in the US economy were taken and different econometric tests were used to measure the efficiency of the markets in four forecast horizons (one, three, six and nine months). Unlike the detailed sub-periods analysis results which have depicted a complex picture, unconditional excess return was found to be close to zero for the full study period.

The study has also tested the weak and semi-strong forms of the EMH in the data set; and failed to be conclusive as to the weak and semi-strong efficiency of the markets. The researchers usedOLS regression the predictability of returns from the dependent variables to test the existence of predictable patterns; thus, the random walk hypothesis. The weak form of market efficiency (here measured as an OLS regression between the return and its lagged values) has been shown to prevail for some of the commodities. The study incorporated the US consumption, terms of trade, interest rate, industrial production, money supply and consumer price index as components of publicly available information to test the semi-strong form of market efficiency. The paper once again used an OLS regression of the return on its lag value and the macro-variables. The regression result shows that, the test fail to reject the null hypothesis of semi-strong market efficient for one and three months forecast horizon while it soundly rejected the null for a longer time horizon. The lists of the macro-variables listed in the publicly available information set gives a good insight to the defining the information set in a commodity market context. Their methodological approach has also showed an alternative approaches to test the EMH. The results they got still add to the differences in results in EMH studies in terms of differences in methodology and time horizons.

The Test for Co-integration in Commodity Markets Fama's definition of an efficient market and its subsequent discussion on "fair game" and martingale model has an additional empirically applicable implication in the commodity futures market. The definition also entails that an efficient futures commodity that "fully reflects" all the known available information presented in the martingale model implies that futures prices must provide full information to predict their future spot prices on maturity. In technical terms, there must be a co-integration relationship between the futures prices and its corresponding spot prices.

Lai and Lai (1991 cited in Li et'al, 2004) premise that in an efficient futures market the co-integration of the futures and the spot prices is a necessary condition as the starting point of their study. It is argued that the futures prices serve as an effective and "unbiased" predictor of future spot prices and also reflect supply and demand equilibrium in an efficient market. Such situation voids the existence of profitable opportunities by exploiting the publicly available information on prices. Given the expected existence of unit root in economic series the futures prices and the spot price series are expected to be co-integrated of order (1,-1) for a market to be efficient.

The researchers tested the "unbiasedness hypothesis"41 and the "Brenner-Kroner (BK)hypothesis"42 in a data set collected from the UK Department of Environment, Food and Rural Affairs (DEFRA) on the weekly wheat spot price in the futures contract termination week and the futures prices from wheat futures contracts traded in London International Financial Futures Exchange (LIFFE). The interest rate is the Bank of England repo base rate43. The study covered the period from November 1985 to January 2004 and collected 110 observations. In addition tothe test for the "unbiasedness hypothesis" and the "BK hypothesis" they further intended to examine the "co-integration paradox"44 uncovered by Kellard (2002).The Augmented Dickey-Fuller test reveals that the spot prices, lagged futures prices and the interest rate series are all I(1). The estimation of the "unbiasedness hypothesis" and "BKhypothesis" using Johansen's co-integration tests discussed in (Johansen 1988, 1991; Johansenand Juselius, 1990) showed that the "co-integration paradox" doesn't hold in the data set. The analysis results demonstrated that the spot price and the lagged futures price are co-integrated of order (1, -1) while spot price, lagged futures price and the interest rate failed to be co-integrated in the order (1, -1, 1).

In the BK model the coefficients of the interest rate were found to be statistically insignificant. The paper thus concludes that the UK wheat futures market satisfies the necessary condition for market efficiency and implies that the spot prices are predictable from their futures prices. Given the accumulated long year experience in such markets, the result from the study might not come as a surprise. Such developed markets have well informed and sensitive speculators that exploit arbitrage opportunities arising from dis-equilibrium and they bring the market to equilibrium (Mananyi& Struthers, 1997). This study has shown that the UK futures market futures prices and spot prices have a long run relation; this nonetheless does not guaranty short run equilibrium.

Capitalizing on these gaps the following papers used existing statistical techniques to study long-run and short-run equilibrium relationship between the two prices. Wang&Ke (2005) tested the co-integration between the two wholesale cash markets and futures exchanges for wheat and soybean to determine the efficiency of agricultural commodity futures market in China. The researchers used weekly cash market price data from Tianjin Grain Wholesale Market (TGWM) and Zhengzhou Grain Wholesale Market (ZGWM); and futures market prices for the commodities from China Zhengzhou Commodity Exchange (CZCE) and the Dalian Commodity Exchange (DCE). The national average cash price is also included in the study. The study covered the period January 1998- March 2002 and used six forecasting horizons(1 week, 2 weeks, 1 month, 2 months, 3 months and 4 months). In the co-integration analysis, the researchers included two seasonal dummy variables (for growing-season and harvest season) to examine the seasonality effect. Besides the co-integration analysis, a weak exogeneity test is used to check whether transitory shocks can affect the established long-run equilibrium relationship, if any.

The Johansen's co-integration, which uses the maximum likelihood-ratio to test co-integration, result shows that the futures soybean prices are well integrated with all the three cash prices used in the study. The weak exogenity test, however, indicated that the DCE futures price is short-run inefficient with ZGWM cash price. On the other hand, the wheat futures prices fail to co-integrate with any of the cash price series. Government intervention and over speculation are deemed to explain the inefficiency in the wheat market. Nonetheless, the seasonality effect is not found in both commodity markets.

The study underlined the effect of an interventionist government approach on market efficiency and further concretizes the arguments of the proponents of free market. It has also shown the negative impact of speculation in market efficient. Looking these two issues on the other side, they are policy recommendations to fashion and maintain efficiency of a market. The study used the weak exogenity test to comment on short run relationship between futures and spot prices, an error correction mechanism (ECM) was also used in other studies to test short-run relationships between these prices.

Santos (2009), citing earlier works, distinguished between market efficiency and unbiasedness ina futures market. The risk neutral co-integration between the futures price and the spot price

represents the unbiasedness hypothesis whereas an efficient but a biased market exists when the disequilibrium relationship between the two prices is explained by the risk premium. Another extension to market efficiency study employed in this paper is the time dimension; where short runand the long-run market efficiency are examined. Santos studied futures prices of corn, wheatand oats contracts in the Chicago Board of Trade from the period 1997 to 2007 and from 1880 to1890. The closing futures prices at the contract maturity date are taken as the corresponding spot prices. The study limits its forecasting horizon to only four and eight weeks due to the dearth of the 19th century data. Both the Engle-Granger and the Johansen co-integration results fail to accept the null hypothesis that there is no co-integration and proved the efficiency of the contemporary and the 19th century market for all commodities.

The unbiasedness hypothesis, however, holds only for four-weekwheat series and eight-week-oat series of the contemporary market and eight-week-oats series of the 19th century futures market. The short run disequilibrium dynamics (studied using an error correction mechanism (ECM) reveal the short-run efficiency of the all wheat series; but the results of oat and corn are mixed. The researcher used a relative measure of efficiency to compare the two periods' short-run market efficiency. 45 Generally, the relative measure shows that the 19th century futures market performed as efficient as the contemporary market. The researcher concluded that the level of efficiency seen in the 19th century market justifies the argument by the grain trade historians on the development of futures exchange that its development is mainly shaped by individuals who wants to reduce price risk. The development of commodity futures market in developing nations, especially in Africa, has avery short history. The fact that such markets in the US were present in the 19th century and that they were performing as efficient as the contemporary markets is quite an interesting finding. Santos indicates the efficiency but not the unbiasedness of most of the contracts. This study did not empirically show the existence of the time varying risk premium in explaining the difference between the two. A study by Manayi & Struthers (1997) neatly explains such differences using the ARCH and GARCH model. Mananyi & Struthers (1997) tested the validity of the EMH for cocoa trading in the London Futures and Options Exchange. A monthly spot and futures prices within the period January 1985to December 1991 and a co-integration analysis is used in the study. The researchers, among others, argued that the rejection of the EMH implies either the market inefficiency or the existence of a time varying risk premium. Modeling of this time varying risk premium necessitates the use of an auto-regressive

conditional heteroscedasticity (ARCH) model and its more general version: the generalized ARCH (GARCH) model46. The GARCH- in mean (GARCH-M) model is estimated in the study.

Using the prices in their logarithmic form, the Engle- Granger co-integration method reveals the absence of a co integrating vector. The researchers then employ the ARCH and GARCH model to verify whether the result implies inefficiency or the existence of a time varying risk premium. In modeling the time varying risk premium, the ARCH (1) model was found to be more appropriate than the GARCH (1, 1) model. The Ljung Box statistics, however, shows the strong persistence of an autocorrelation. The researchers attribute the autocorrelation to the movements in either to presence of risk premium or to the inefficiency the market. The sum of the parameters in the ARCH (1, 1) model has indicated presence of shock (volatility) that intern implies market inefficiency. The study labeled its finding to be surprising given the existence of alerted arbitrage forces that exploit such disequilibrium in a market. The authors attribute such surprising finding to the existence of possible supply shocks in the study period and the failure of the study to neglect cross commodity trade effect and complex institutional factors. Despite their hesitation to accept results, they forwarded strong policy implication to LDC's. They recommended that a futures market dependent export stabilization policy is a riskier choice due to the prevalent shocks that exists in primary commodity in such countries and stressed the need to look for other alternative like buffer stock arrangement is a good alternative to the futures market.

The study extended the unbiasedness hypothesis discussed earlier. The conclusions of the study noted the prominent role of arbitrage forces in maintaining market efficiency. Their policy recommendation, however, is difficult to swallow given the relatively short period and the type of commodity studied in the paper. Studies in commodity market efficiencies have also witnessed the use of both the random walk and co-integration approach to study market efficiency, like in Xin& Chen (2006). Xin& Chen studied the efficiency of copper and aluminum futures trading in China's Shanghai Futures Exchange. In 2004, copper and aluminum futures respectively accounts for 39% and 8% of the total futures trading in the exchange. The random walk hypothesis and the unbiasedness hypothesis were tested using a daily closing price data from the Shenzhen GTA CSMAR futures database covering the period from the 4th of January

1999 to the 31st of December 2004. The spot prices used in the study are approximated by the delivery date futures closing prices of a contract.

The researchers argued that, due to the possible rejection of the assumption of normality of distribution in many financial time series, a better test for the random walk hypothesis is the variance ratio test than the Augmented Dickey-Fuller (ADF) and Kwiatkowski-Phillips-Schmidt-

Shin (KPSS) tests. The variance ratio test for lags 2, 4 and 8 days on log prices fail to reject the null hypothesis for random walk. The results are also consistent with what is found using the ADF and KPSS test. The test for the unbiasedness hypothesis employing the Johansen co-integration has also shown the failure to reject the hypothesis. The independence of the daily price changes, confirmed by the failure to reject the random walk hypothesis, and the co--integration of the futures and spot prices, shown by the failure to reject the unbiasedness hypothesis, implies the efficiency of the exchange for the two commodities in the study period. The study attributes these results, which support the price discovery process, to the increase in the skill and awareness of the exchange participants and the regulatory changes that were made in 1999 to improve the effectiveness and efficiency of the markets in China. The need to create a comfortable regulatory environment to guaranty efficiency and integrity of the system in these exchanges sends a noticeable message to emerging exchanges in developing nations like Ethiopia.

Explaining Anomalies in Efficient Market Hypothesis

Mixed results in the test for market efficiency are prevalent in both capital markets and commodity futures market. Li et'al (2004, p3) summarized the possible explanations for these diverse results by earlier works on commodity futures market. The list include "difference in time periods analyzed and in the methodology used (Jumah et al. 1999), the presence of a risk premium (Krehbiel and Adkins, 1993), the inability of the futures price to reflect all publicly available information (Beck, 1994), the inefficiency of agents as information processors (Kaminsky and Kumar, 1990), and the neglect of interest rates (the non-stationary part of storage cost) which play an important role as they enter arbitrage relationships between spot and futures prices (Brenner and Kroner, 1995)" There are also mixed result in capital market efficiency studies that implies the predictability of prices (returns) from their past history.

Economist argues that the absence of a non-zero correlation coefficient does not necessarily rule out market efficiency in a specific market. What matters rather is whether the predictability in the results which is demonstrated by the non-zero correlation coefficient result can be exploited to make an abnormal profit above costs involved in using the information (Malkiel, 2004). Dimson & Mussavian (1998) further noted that the possibility of little abnormal returns before expenses and fees are not ruled out in an EMH. The need to distinguish between statistical significance and economic significance is rigorously noted by (Malkiel, 2004) and (Fama, 1970) in explaining the anomalies prevailed in some studies. They argued that a small level of statistically significant often do not guarantee an economic significance that can be exploited to realize abnormal returns. Most predictability reported in literatures seems to disappear after a short time or when exposed to other methodological treatments (Malkiel, 2004). The short run predictability of returns, according to experts in behavioral finance, is in conformity with psychological feedback mechanisms. When the price of a certain stock increases more individuals will tend to demand it and result in a continuous increase in its price in the short run. Another possible explanation to the short-run momentum from behavior lists is that investors may under react to new information and results in a positive serial correlation as was found by some empirical works. Such short-run momentum can also be found if investors over react to new information (Ibid).

What is important to note is the consistency and strength of such predicable patterns. They often prevail in the short-run and they tend to disappear right after their occurrence. The "January effect" and the "day-of-the-week effect" can be a good example in this respect. Malkiel documented some level of predictable patterns in January (Haugen and Lokonishok, 1988), around the turn of the month (Lakonishok and Smith, 1988), around holidays (Ariel, 1990), and higher Monday returns (Frenchm, 1980). It is for this reason that rejection of random walk does not necessary implies presence of a persistent profitable opportunity (in other words inefficiency) in the market while the failure to reject random walk strictly implies efficiency of the market (Fama, 1970; Lo &MacKinlay, 1988, Malkiel, 2004; Lim et'al, 2004). Though linear and nonlinear dependencies in price (returns) shows a potential for their predictability, it has to be demonstrated that these dependencies are strong and persistent enough to create an exploitable profitable trading opportunity in the market; otherwise, as Lim et'al(2004, 131) put it: "it will be a strong statement to conclude that the market is inefficient" if we reject the random walk

hypothesis. Along this line, the windowed testing procedure with its correlation and bi-correlation test statistics is used in literatures to identify the persistence and strength of the linear and nonlinear dependencies, respectively. The strength of the dependence is, however, can better be demonstrated by a correlation coefficient.

The windowed testing procedure divides the full period data into different sub-periods (windows) and separately test for the presence of dependencies in the time series in each windows using the correlation statistics (for linear dependency) and the bi-correlation test statistics (for non-linear dependency). The approach is based on the rationale that inefficiency in the full study period may be driven by some pocket inefficient sub-periods and the inefficiencies are, thus, episodic and short-lived that cannot be exploited by traders (Ammermann & Pattrson, 2003; Lim & Hinch,2005; Lim et'al, 2007; Todeaet'al, 2009). The correlation statistics is a variant of the Ljung-Box test47 and the bi-correlation statistics is introduced by Hinich& Patterson (1996) (Ammermann& Pattrson, 2003). Both statistics tests the null hypothesis of an independent and identically distributed observation against non-random walk alternative hypothesis (Ibid). These tests only tests provide p-values to indicate the statistical significance/insignificance of the persistence of the inefficiency. Though these p-values can be used to indirectly tell the strength of the dependence, a correlation coefficient is better in clearly quantifying extent of linear dependencies.

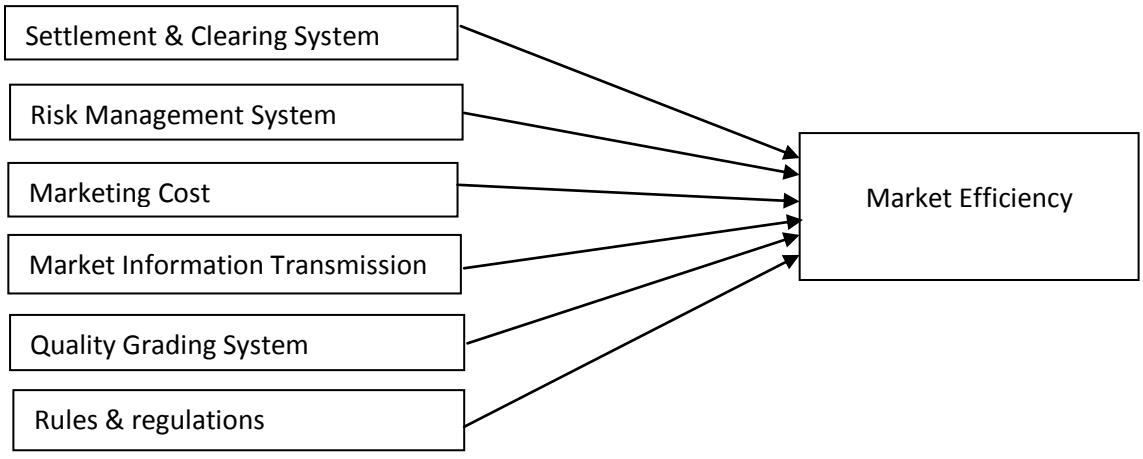

Figure 2:. Conceptual Framework to guide this study
Source*: Teshome A. (2017) revolutionizing commodity marketing system in Ethiopia*

As shown in the figure above, market efficiency is a dependent variable which is affected by other independent variables. The framework is composed of six components of independent variables which are Settlement & Clearing system, Risk management system, Marketing cost, Market information transmission,Quality grading system, Rules & regulations.

The model has the potential of measuring the efficiency of ECX. The choice of this framework is due to the fact that it is strongly information based approach which is good for problem identification & using that as an input for mapping against the impact indicators. The questionnaire is derived from this framework.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

The previous chapter discussed theories and fundamental notions that are related to the paper in one way or another. This chapter deals with the methodology of the study, i.e. research design, sampling & data analysis techniques.

3.2. Research Approach

The study method is more of quantitative method with emphasis on conducting questionnaireand analyzing the data by statistical software. Quantitative methods are research techniques mainly dealing with numbers and measurable features. But in order to get balanced information or as a confirmation for the information that is taken from the respondents of the questionnaire (i.e., employees of ECX), the researcher took 10 market actors to be interviewed.

3.3. Research Design

"A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure" (Kothari, 2004, p.31).The research design that is used in this paper is explanatory which explains the cause and effect relationship. Unlike the previous studies that are discussed above on the first chapter,that used descriptive research design, this thesis goes beyond description and attempts to explain the reasons for the phenomenon that the descriptive study only observed. This research design was utilized because of resource and time limitation to undertake longitudinal survey.

3.4. Population and Sampling

Population is the total group of people from which information is required. The total population of the study consists of 800 ECX employees, which were categorized as similar in characteristics but different in experience, and educational back ground in ECX.

$$n = \frac{N}{1+N(e)^2} = \frac{800}{1+800(.05)2} = \underline{\underline{267}}$$

This being the fact, from the said large population relevant to the study, the total number of Sample representatives of the population with 5% margin of error and 95% confidence level will be 267. Furthermore, probability sampling method i.e., simple random sampling was used and the population had equal chance of selection.

3.5. Data gathering instruments

The data was collected from the secondary data based on studies on ECX and sesame. Primary data was collected using questionnairewhich was developed by researcher own.The questionnaire was used because it has the advantage of participating large respondents over other data gathering techniques; it limits inconsistency and also saves time. The questionnaires were designed in English language. The researcher further investigated the problem from primary data from literatures, articles, previous research works of scholars and leaves the remaining to futures research works by those interested to the issue. The target population of the research wasemployees in the sesame trading in ECX.

The following procedure was followed to administer questionnaire to respondents. First, the researcher approached potential respondents to ask their cooperation in filling the questionnaire and explain the purpose of collecting data, how the questionnaire will be filled and the confidentiality of the data obtained. Then, the questionnaires were distributed and respondents wereasked to furnish information honestly and return the filled up questionnaire.

The questionnaire has two parts. The first part of the questionnaire is about demographic characteristics of respondents such as gender, year of participation, educational status and job position. Part two contains the main part of the questionnaire which assess the determinants of market efficiency. The questions are in statement form and ECX employees were asked to express their agreement/disagreement in the five point likert scale, where 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree.Data collected through questionnaires were analyzed quantitatively by utilizing statistical tools such as tabulation, bar charts and pie charts to present data.

3.6. Data analysis technique

The data that were collected from data sources organized and statistical computations were made to explain the inherent relationships between the variables.In meeting the objectives stated in the above section, the raw data gathered from primary sources were first checked for completeness, reliability and consistency which were done through analysis ofcronbach alpha test and KMO (Kaiser Mayer Olkin measure of sampling adequacy) and finally analyzed using statistical techniques such as, Exploratory Factor Analysis and the Construct Validity, Pattern matrix, Total variance explained etc. All the above mentioned quantitative techniques were computed using the Statistical Package for Social Science (SPSS statistics) version 20.Accordingly, the qualitative part of the data analysis was conducted through interview. The summary of both methods makes the data analysis of a mixed type, which is more elaborative than using only one of them.

To test the validity of the instrument, cronbach alpha test was conducted. It was calculated to measure the reliability of the instrument. The cronbach alpha came as 0.700 as shown in the table below, thus the instrument was considered reliable for the study.

Table: 3.1 Cronbach Alpha

Reliability Statistics

Cronbach's Alpha	N of Items
.700	24

3.7. Ethical consideration

In order to conduct the research questionnaires were distributed and conducted through all the process of analyzing and interpreting the data the researcher kept respondents identity confidential.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1. Introduction

In this chapter, the data collected through questionnaire and interview is analyzed using statistical tool of SPSS version 20. First the reliability of the scales used is discussed followed by the market efficiency determinants analyzed by statistical tools.

The main purpose of the study was to explain the determinants of market efficiency of ECX. In order to meet the objective and to address research questions of the study, the researcher has obtained necessary primary data. 267 employees of ECX were taken as a sample for the questionnaire data gathering and 10 market actors (In this case sesame seed traders) were the respondents of the interview question. This chapter, data analysis & discussion present the results of different methods employed in the study for the sake of analyzing data.

4.2. Descriptive Statistics

The statistics are included to check the integrity of the data and to provide an overview of the statistics. The results of the descriptive statistics of the sample are as follows:

Table: 4.1 Item Statistics

	Mean	**Std. Deviation**
The supply of sesame is high in terms of quality	3.97	.811
The grading system for sesame is highly professional	4.16	.773
Sesame is traded through a system of industry-accepted product grades & standards.	4.13	.848
so far, there was a problem of mixing up sesame with different sources of varying quality	3.46	1.101
There is a transparent means for price discovery	4.22	.749
The transaction cost of sesame marketing is high.	3.46	1.251
The service cost of sesame marketing is high.	2.61	1.309
There was zero contract default recently.	2.31	1.268
There was zero payment default recently.	2.27	1.251
There was zero delivery default recently.	2.37	1.134
ECX uses electronic payment method.	4.20	.931
The payment clearing system is fast.	4.10	.908
Price is the factor that affects marketing as a whole in ECX sesame market.	3.75	1.137
There exists central depository system.	4.54	.529
The information transmission system is the factor that affects marketing as a whole in ECX sesame market.	3.62	1.246
There is an electronic warehouse receipting system.	4.30	.858
ECX uses website as a source of marketing information transmission on sesame business.	4.36	.669
ECX uses mobile phone as a source of marketing information transmission on sesame business.	4.37	.627
ECX uses mass media as a source of marketing information transmission on sesame business.	4.39	.653
ECX guarantees farmers to receive the price from a purchaser or intermediary.	3.99	1.092
ECX achieved its vision of revolutionizing Ethiopian agriculture through a dynamic and efficient marketing system?	3.86	.969
ECX's contribution to the business is positive with regard to its objective.	4.21	.685
Current production of sesame seed is improving both in volume and quality.	3.49	1.016
Sesame is cheaper externally than the local market.	3.93	.986

It can be seen from the above table that, some factors have been ranked highest by the respondents. To mention some, the variables included in product quality factor has been ranked highest with average mean value of 4.14 and average standard deviation of 0.78 which implies that the respondents perceive this factor to have a high effect on the efficiency of ECX.

4.3. Exploratory Factor Analysis and the Construct Validity

Before the explanatory factor analysis, the researcher determined if the sample data are suitable for the analysis. The table 4.2 gives information about two assumptions of factor analysis is to determine if the subscales were suitable for factor analysis, the Bartlett test of sphericity& KMO (Kaiser Mayer Olkin measure of sampling adequacy) tests were used.

The first test examined if the subscales of the scale are inter-independent and the latter examined sample sufficiency. For the KMO statistic the value should be above the bare minimum of 0.5 preferably higher (Field, 2013). As can be seen from the table below, KMO>0.60 indicated that the sample data are suitable for factor analysis.

Given the large sample sizes usually used in a factor analysis P<0.001 will almost certainly be significant. A non-significant test would certainly indicate a massive problem (Field, 2013). However, this significant value only really tells that this study doesn't have a massive problem.

Table: 4.2 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**.674**
Bartlett's Test of Sphericity	Approx. Chi-Square	3377.562
	df	276
	Sig.	.000

Table 4.4: Pattern Matrix

The factors along with their loadings are mentioned in the table below

ITEMS	FACTOR					
	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6
There was zero contract default recently.	.936					
There was zero payment default recently.	.923					
There was zero delivery default recently.	.797					
The transaction cost of sesame marketing is high.	.612					
The supply of sesame is high in terms of quality		.759				
The grading system for sesame is highly professional		.689				
Sesame is traded through a system of industry-accepted product grades & standards.		.639				
ECX's contribution to the business is positive with regard to its objective.		.614				
There is a transparent means for price discovery		.535				
ECX uses mobile phone as a source of marketing information transmission on sesame business.			.771			
ECX uses mass media as a source of marketing information transmission on sesame business.			.758			
ECX uses website as a source of marketing information transmission on sesame business.			.751			
There is an electronic warehouse receipting system.				.768		
ECX guarantees farmers to receive the price from a purchaser or intermediary.				.677		
ECX uses electronic payment method.					.720	
The payment clearing system is fast.					.706	
Sesame is cheaper externally than the local market.						.546
ECX achieved its vision of revolutionizing Ethiopian agriculture through a dynamic and efficient marketing system?						.533

4.4. Factor Analysis of the Market Efficiency

The six factors extracted for further study are shown in table 4.5. These 6 factors that were extracted included the items which have loadings of more than 0.3 and have been referred as the Market Efficiency in further analysis. The table below is followed by the explanation of all these six Market Efficiencies.

Table 4.5Factor Loading

Factor	Item	Factor Loading	Factor Name (Market Efficiency)
1.	There was zero contract default recently.	.936	**Marketing risk & Cost**
	There was zero payment default recently.	.923	
	There was zero delivery default recently.	.797	
	The transaction cost of sesame marketing is high.	.612	
2.	The supply of sesame is high in terms of quality	.759	**Product Quality**
	The grading system for sesame is highly professional	.689	
	Sesame is traded through a system of industry-accepted product grades & standards.	.639	
3.	ECX uses mobile phone as a source of marketing information transmission on sesame business.	.771	**Information Transmission Media**
	ECX uses mass media as a source of marketing information transmission on sesame business.	.758	
	ECX uses website as a source of marketing information transmission on sesame business.	.751	
4.	There is an electronic warehouse receipting system.	.768	**Transaction Risk**
	ECX guarantees farmers to receive the price from a purchaser or intermediary.	.677	
5.	ECX uses electronic payment method.	.720	**Payment Method**
	The payment clearing system is fast.	.706	
	There is a transparent means for price discovery	.535	
6.	Sesame is cheaper externally than the local market.	.546	**Market Efficiency**
	ECX achieved its vision of revolutionizing Ethiopian agriculture through a dynamic and efficient marketing system?	.533	
	ECX's contribution to the business is positive with regard to its objective.	.614	

Marketing Risk & Cost

Marketing risk and cost factor is the name given to the first determinant for market efficiency identified through factor analysis. All these variables have factor loading of more than 0.6. The items included in this factor are: There was zero contract, payment and delivery default recently, the transaction cost of sesame marketing is high.

The major contributors to marketing risks are contract, payment & delivery defaults. The results reveled that market risks are one of the determinants of market efficiency. However, there exists no default risk in ECX. Hence, it contributes to the efficiency of ECX.

The market cost is found to be the determinant of market efficiency in ECX. According to the respondents, the transaction cost of sesame marketing is high, but the service cost is somewhat fair. Besides, the information transmission system is the factor that affects marketing as a whole in ECX sesame market.

Product Quality

This emerged as the second factor. The variables included are: The supply of sesame is high in terms of quality, the grading system for sesame is highly professional, and Sesame is traded through a system of industry-accepted product grades & standards.

All these variables have factor loading of more than 0.6. This factor deals with the quality sesame that is being traded in ECX. Moreover, the variables are strongly related to market efficiency of ECX. Besides, it's been identified that there exists a transparent means for price discovery.

Information Transmission Media

It is the name given to the third factor which has got a factor loading of more than 0.7. The variables included in this factor are: ECX uses mobile phone, mass media and website as a source of marketing information transmission on sesame business. They all are related to the media of information transmission.

It was identified that ECX uses different electronic media as a source of marketing information transmission on sesame business.

It contributes to the efficiency of the company as it is fast, convenient & easily accessible media. Thus, it affects the success of communication.

Transaction Risk

This is the name given to the fourth factor with a factor loading of more than 0.6. The items included are: There is an electronic warehouse receipting system, ECX guarantees farmers to receive the price from a purchaser or intermediary.

It is extremely vital for the farmers to receive the price from a purchaser/ intermediary, and ECX is found to be dependable & reliable to guarantee the farmers for the safe transaction. Furthermore, it's been revealed that electronic warehouse receipting system is implemented.

Payment Method

This name was given to the fifth factor which has got a factor loading more than 0.5. The items that correlated with this factor are: ECX uses electronic payment method, the payment clearing system is fast, there exists central depository system.

All these variables had one thing in common and that was the electronic payment and clearing system. Not only having electronic payment system is enough, it must be functional, fast and easily accessible. In this regard, ECX provides it all.

Market Efficiency

This name was given to factor number 6 with factor loading more than 0.5. The items that were strongly associated with this factor are: sesame is cheaper externally than the local market, ECX achieved its vision of revolutionizing Ethiopian agriculture through a dynamic and efficient marketing system, ECX's contribution to the business is positive with regard to its objective.

All these factors had factor loadings of more than 0.5. It's been identified that ECX achieved its vision of revolutionizing Ethiopian agriculture through a dynamic and efficient market system. Hence, it contributes a lot to the business with regard to its objective.

4.5. Total Variance Explained

The first part of the factor extraction process is to determine the linear components within the data set (the Eigen vectors) by calculating the Eigen values of the R-matrix. By default SPSS uses Kaiser's criterion of retaining factors with Eigen values greater than 1. Before extraction SPSS has identified 24 factors within the data set. The Eigen values associated with each factor represent the variance explained by that particular factor; SPSS also displays the Eigen value in terms of the percentage of variance explained. SPSS then extracts all factors with Eigen values greater than 1, which leaves the case with 6 factors.

Hence, the result of this factor analysis indicates there are six components having an Eigen value greater than 1 explaining 64% of the variance. Initial Eigen values with a total value higher than one, typically indicates a strong extraction (Child, 1990). All values smaller than 0,1 are not indicated in the results and can be seen as insignificant.

To determine how the 24 factors relate to the 6 new extracted factors a factor analysis was done using principal axis factoring as extraction method and the promax with Kaiser Normalization as rotation method.

4.6. Analysis of Interview Questions

In order for the analysis to be free of bias, the researcher gathered qualitative data through interview of 10 sesame seed traders to assess the determinants of market efficiency of ECX. The interview questions were forwarded and responses are summarized and illustrated briefly in this section.

The question regarding the quality of sesame responded as sesame seed does not mix up with different sources of varying quality agreed by 8 of the respondents. There exists a legal standardization process of the grading system.However, it's been revealed that there is quality problem in which some foreign matters has been mixed up with the seed. But as stated in the above discussion, ECX had successfully managed this problem.On the other hand, almost all of the trader respondents agreed up on the bureaucratic system of the management which is found to be a bigger problem.

For the question of market information transmission, the traders explained how they get the price and market information and they discover it from electronic media such as viber, telegram, the company's website, the board, SMS etc.All of them agreed that the payment clearing system which is categorized as FAST.

About the transaction cost of sesame trade, all of the respondents complain that the transaction cost is very high but the service cost is fair.Of all the 10 respondents; 8 of them responded that they never faced default risk.

The last question which was an open ended question which was about the major problems that the traders identified in sesame marketing has been responded as follows.

There existed price volatility/fluctuations so that traders has got a problem of forecasting the price and unable to plan their trade ahead of time. The other problem is lack of value adding activities that can improve the efficiency of ECX. On the other hand, market price is different in international market than the domestic one.

In order to begin the transaction, traders must log in to the internal system of ECX, but the internet connection problem hinders the smooth functioning of the process. The other problem reveled is high cost of the transaction.

Of all the problems mentioned above, the most common ones are the price and cost issue.

4.7. Discussion

Factor analysis is a statistical technique used to identify a relatively small number of underlying dimensions, or factors, which can be used to represent relationships among interrelated variables. The emphasis in factor analysis is the identification of underlying "factors" that might explain the dimensions associated with data variability (David J. and M. Knott, 1999). Factor analysis can be best described as a tool to help identify the underlying factors that might explain the dimensions associated in large data variability.

Factor analysis is not a new method of data analysis. It has been used extensively as a data analytic technique for the better part of the 21st century. For instance; It has been used for similar type of research for analyzing the factors that contribute to economic development in the state of Tennesse on 2004, also in other thesis to study the various dimensions of project specific

risks and organizational climate in the software project, and also "exploratory factor analysis on hongkong equity market" is a study which was conducted on 2012 using factor analysis methodology. Having these as examples and evidences, we can say that social scientists have used it extensively for examining patterns of interrelationships, data reduction, instrument development, classification and description of data, data transformation, exploring relationships in new domains of interest etc (Rummel, R.J. 1990).

On the other hand, a previous research was conducted on similar topic which used a descriptive research design to describe the factors that affect the market efficiency of ECX. Unlike this paper, the data on the previous study was analyzed using statistical techniques and simple quantitative analysis techniques such as percentage and frequency. Pearson correlation and linear regression to analyze the relationships among dependent and independent variables were used to explain and to determine the significant differences between and among respondent's views on factors of market efficiency with respect to market efficiency. The factors on the previous study were: Price Discovery, Quality Grading, Risk Management, Clearing and Settlement, Market data dissemination, Transaction Cost and Market Efficiency. In general, the results are somewhat similar with this study even though the methodology is different.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary of Major Findings

The key findings of the study are summarized as follows:-

- The study showed that those determinants of efficiency are very important instruments to increase market efficiency in ECX.
- The finding revealed that price is the factor that affects marketing as a whole in ECX sesame trade.

  In relation to price discovery, it is communicated on electronic media at any time before trade and direct communication at the time of trade. Therefore, there exists a transparent means for price discovery.

  On the contrary, as per the traders' response, high price volatility is the main challenge that encountered. Price fluctuates every time so that it is hard for them to estimate and plan their business ahead of time. Besides, the price of sesame is cheaper on international market than the local one.
- The study implied that the grading system for sesame is highly professional. However, as per the respondents, it showed that, some foreign matters have been mixed up with the seed but sine ECX has a professional team to investigate this, the effect will be zero. The client will get everything as per the contract.
- In connection with the marketing risk, with higher percentage rate indicates effective risk management.The findings showed that risk management is controlled by the organization in order to mitigate the risks that hinder the efficient trading system.
- The study finds out that the clearing & settlement and market efficiency had a positive and strong relation. ECX guarantees farmers to receive the price from a purchaser or intermediary. Moreover, there exists electronic payment clearing system and it is found to be efficient. Besides, there is an electronic warehouse receipting system.

  Overall, the current production of sesame is improving both in volume and quality and also there exists a central depository system.

- Regarding the marketing information transmission, the finding revealed that the reliable and accurate information is distributed, information is easily accessible, available and important to make a critical decision. The company uses ICT to more accessible and on time business information to the society. However, at the time of trade, the system where traders login, is sometimes slow due to the network problem.
- The study digs out the higher transaction cost. The finding indicated that the transaction cost has a great number of percentages as compared with the other options and also there is a positive relationship with the market efficiency. On the other hand, the respondents agreed that the service cost is fair.

5.2. Conclusion

The researcher tried to conclude this study with points in respect with positive and negative assumptions.The determinants of market efficiency assessed were marketing risk, marketing cost, product quality and grading system, information dissemination, transaction risk, clearing & settlement. To see association of the factors, data analysis was done and all the factors had statistically significant association with market efficiency.

The study aims to examine the respondents of negative assumption towards market efficiency factor which is transaction cost and other challenges that has been practiced in the company so far.

Moreover, most of the market efficiency determinants are found to be desirable to influence members' participation in the membership trading but the information transmission media and product quality had strong relation. The remaining determinants such as payment clearing method, marketing risk management had relatively the higher influence than the other attributes but the transaction cost and price fluctuation have been negatively attributed. Thus, all these factors determine market efficiency in ECX.

5.3. Recommendations

Based on the findings, the researcher suggests the following recommendations to address the intended goals of ECX and to enhance its efficiency and to alleviate the challenges.

- ECX should collaborate with supportive institutions like Ethio-Telecom to solve the networking problem.
- ECX should develop a market efficiency strategy and policy in connection with the strong and poor performances of each determinant of market efficiency and also including other variables which are not included in this study.
- The need of the collaborative efforts of all concerned stakeholders including researchers, traders, farmers etc. to enhance the market efficiency and make synergy effect and using of information technology to automate end to end system from warehousing to trading to clearing and settlement of payments to delivery of commodity.
- ECX should share experiences and best practices with other successful commodity exchanges in other countries to continue the opportunity and benefit of commodity exchange.

5.4. Further Area of Investigation

The study assessed the determinants of market efficiency in ECX. Nevertheless, the findings should be interpreted carefully as there will be a number of variables which also represent market efficiency for further research.

In collecting the primary data, the research has focused only on the head quarter employees and sesame traders. But the stakeholders also include sellers, wholesalers, Processers, farmers and all the members of ECX, for which the researcher did not take in to account in this study. Therefore, studies should include other data collection mechanism such as focused group discussion and in-depth interview.Thus, the future researcher could conduct a study on the same title by considering the above mentioned factors.

Reference

Abadi, G. (2018) 'An International Journal of Plant Research & Biotechnology', *Sesame Production, Challenges and Opportunities in Ethiopia*, v 31(1), pp. 51-56

Abdurezak H. (2010) 'Market Efficiency of the Ethiopia Commodity Exchange', *The case of export coffee trading:* Addis Ababa University

African Union (2007), *Study of the potential for commodity exchanges and other forms of market places in eastern and southern Africa*, Addis Ababa.

Alemu D. & M. Gerdien, (2010).*The Ethiopian Commodity Exchange an Over View*, Working Paper, 3. Wagningen University, joint publication of Ethiopian Pulses, Oil seeds, & Spices processors Exporters Association (EPOSPEA) and Public Private Partnership on oilseeds (PPP).

Al-Khazali, O.M., Ding, D.K., &Pyun, C.S. (2007). A new variance ratio test of random walk in emerging markets: a revisit. Financial Review 42 (2),pp. 303-317

Beaver H. William, (1981), "Market Efficiency", *The Accounting Review*, Vol. 56, No. 1, pp. 23-37.

Bethlehem Girma, (2009), Critical Assessment of ECX.

Daily Ethiopia. (2010) 'ECX launches Direct Specialty Trade' February 18 edition.

Dawit, A. &Gerdien, M. (2010) 'The Ethiopian Commodity Exchange (ECX)', *An overview*, pp. 1-43

Dessalew, Z. (2011). *Challenges and prospects of commodity exchange in Ethiopia*, Ethiopia.

Eleni, G. (2017) 'A view of ECX from within, without', *an overview*, Vol 18, No 907

FamaF.Eugene, (1970), "*Efficient Capital Market: A Review of Theory and Empirical Work*", Journal of Finance, Vol 25, Issue 2, pp. 383-417

Gabre-MadhinZ.Eleni and Haggblade S., (2001), Successes in African Agriculture: Results of an Expert Survey, International Food Policy Research Institute Washington, DC,USA.

Gideon O.E, (2003), *Promoting Agricultural Commodity Exchanges in Ghana and Nigeria:* A Review Report to UNCTAD

Gizaw, D. (2014). *Estimating the overall revenue, technical & allocative efficiencies of Ethiopian Commodity Exchange (ECX) authority*. The Hague, the Netherlands University.

Habtamu, W. (2014) 'International Journal of Economics & Management Sciences' *Assessing the Opportunity and Challenges of Ethiopia Commodity Exchange for the Members of Agricultural Product Export*, v 3:3

Issac, P. (2011), *An assessment of the opportunities and challenges of the Ethiopian commodity exchange*, Ethiopia.

Kassa, Y. (2015) 'Marketing Mix Practices & Challenges with Special focus on sesame product': Addis Ababa University

Mohammed, A. (2017) 'African Journal of Marketing Management' *Ethiopia commodity exchange: Marketing prospects and challenges in focus,*v 9(3), pp.18-24

Muluken A. &Abebe E. (2016), *the contribution of Ethiopia commodity exchange for promoting exports of agricultural products*, Vol. 5, No. 5, pp. 81-90

Niranjan, A. (2004) 'A Factor Analysis Methodology for Analyzing the Factors that Contribute to Economic Development in the state of Tennessee', University of Tennessee – Knoxville

Raju, V. T. and Von Oppen, M. (1982). *Marketing Efficiency for Selected Crops in Semi-Arid*

Ramírez S. & Arellano p. (2015). *Adaptive market efficiency of agricultural commodity futures contracts,* pp. 389-401

Teshome, A. (2009) *Revolutionizing commodity marketing system in Ethiopia.*

Tropical India, International Crops Research Institute for the Semi-Arid Tropics, Hyderabad, India, pp. 50

Zerihun, J. (2012) 'Sesame (*Sesame indicum*L.) Crop Production in Ethiopia: Trends, Challenges and Future Prospects', *Science, Technology and Arts Research Journal,*v 1(3): 01-07

Kaminsky G. and Kumar S. Manmohan, (1990), "Efficiency in Commodity Futures Markets",*Staff Papers - International Monetary Fund*, Vol. 37, No. 3, pp. 670-699

Gabre-MadhinZ.Eleni and Haggblade S., (2001), *Successes in African Agriculture: Results of an Expert Survey*, International Food Policy Research Institute Washington, DC, USA

Mas-ColellAndreu, Whinston D.Michael& Green R.Jarry, (1990), *Microeconomic Theory*, Oxford Universtiy Press, New York, USA

Pindyck S. Robert and Rubinfeld L.Daniel, (1995), *Microeconomics, 3rd ed.*, Prentice-Hall & Tsinghua University Press, China

Gabre-Madhin Z. (2001), ECX, Research Report, *International Food Policy Research Institute* Washington, D.C., USA

Preston E. Lee and Collins R. Norman, (1966), "The Analysis of Market Efficiency", *Journal of Marketing Research*, Vol. 3, No. 2, pp. 154-162

Ratchford T. Brian, Agrawal Jagdish, Grimm E. Pamela, Srinivasan Narasimhan, (1996), "Towards Understanding the Measurement of Market Efficiency", *Journal of Public Policy &Marketing,*Vol. 15, No. 2, pp. 167-184

Rashid, S., Winter-Nelson, A., Garcia, P., 2010. "*Purpose and Potential for Commodity Exchanges in African Economies."* IFPRI Discussion Paper No. 01035. International Food Policy Research Institute, Washington, DC

Blake D., (1990), *Financial Market Analysis*, McGraw-Hill Book Company Europe, Berkshire, England

Johnson, R. L., C. R. Zulauf, S. H. Irwin and M. E. Gerlow, (1990), "The Soybean Complex Spread: An Examination of Market Efficiency from the Viewpoint of a Production Process", *Proceedings of the NCR-134 Conference on Applied Commodity Price Analysis, Forecasting, and Market Risk Management, Chicago, IL.*

Solnik H. Bruno, (1973), "Note on the Validity of the Random Walk for European Stock", *The Journal of Finance,* Vol. 28, No. 5, pp.

Marashdeh& Shrestha (2008), "Efficiency in Emerging Markets - Evidence from the Emirates Securities Market", *European Journal of Economics, Finance and Administrative Sciences,* Issue 12, 143-150

Mishra P.K, Das K. B. and Pradhan B B, (2009), "Empirical Evidence on Indian Stock Market Efficiency in Context of the Global Financial Crisis*", Global Journal of Finance and Management,*Volume 1, Number 2, pp. 149-157

Xin Y., Chen G. and Firth M. (2006), "The Efficiency of the Chinese Commodity Futures Markets: Development and Empirical Evidence", *China & World Economy,* Vol. 14, No. 2, pp 79 – 92,

Appendix

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMMERCE

DEPARTMENT OF MARKETING MANAGEMENT

Dear respondents

The main purpose of this questionnaire is to gather information or primary data in order to assess the determinants of market efficiency in ECX. Your genuine information is highly valuable as it determines the success of this study. Therefore, the researcher is very much grateful for the sacrifice you pay to this end and the information gathered will be highly confidential and purely for academic purpose.

Direction:

- No need to write your name.
- Please put a tick (√) mark on the appropriate box of your answer.

Thank you in advance for your time to fill this questionnaire.

Part I: Demographic information of respondents

1. Gender:

   Male ☐ Female ☐

2. Educational Status:

   Diploma ☐ BA Degree ☐ Masters ☐ Above ☐

3. Job position, please specify

   ……

4. Service year in the organization

   <2 years ☐ 2-5 years ☐ 6-10 years ☐ >10 years ☐

Part II.Market efficiency related information

The items are five point scales with 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree.

No.		Level of your agreement				
		1	2	3	4	5
1.	**Product Quality**					
1.1	The supply of sesame is high in terms of quality.					
1.2	The grading system for sesame is highly professional.					
1.3	Sesame is traded through a system of industry-accepted product grades & standards.					
1.4	So far, there was a problem of mixing up sesame with different sources of varying quality.					
1.5	There is a transparent means for price discovery.					
2.	**Marketing Cost**					
2.1	The transaction cost of sesame marketing is high.					
2.2	The service cost of sesame marketing is high.					
3.	**Marketing Risk**					
3.1	There was zero contract default recently.					
3.2	There was zero payment default recently.					
3.3	There was zero delivery default recently.					
4.	**Payment Method**					
4.1	ECX uses electronic payment method.					
4.2	The payment clearing system is fast.					
4.3	Price is the factor that affects marketing as a whole in ECX sesame market.					
4.4	There exists central depository system.					
5.	**Information Sharing**					
5.1	The information transmission system is the factor that affects marketing as a whole in ECX sesame market.					

5.2	There is an electronic warehouse receipting system.					
5.3	ECX uses website as a source of marketing information transmission on sesame business.					
5.4	ECX uses mobile phone as a source of marketing information transmission on sesame business.					
5.5	ECX uses mass media as a source of marketing information transmission on sesame business.					
5.6	ECX enables farmers to receive or guaranteed price from a purchaser or intermediary.					
6.	**Market Efficiency**					
6.1	Can we say that ECX achieved its vision of revolutionizing Ethiopian agriculture through a dynamic and efficient marketing system?					
6.2	ECX's contribution to the business is positive with regard to its objective.					
6.3	Current production of sesame seed is improving both in volume and quality.					
6.4	Sesame is cheaper externally than the local market.					

Part III. Obstacles in sesame marketing

1. What are the major problems identified in sesame marketing so far? Please specify

   ……

   ……

Thank you for your valuable input and kind cooperation.

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMMERCE

DEPARTMENT OF MARKETING MANAGEMENT

Dear respondents

The main purpose of this interview is to gather information or primary data in order to assess the determinants of market efficiency in ECX. Your genuine information is highly valuable as it determines the success of this study. Therefore, the researcher is very much grateful for the sacrifice you pay to this end and the information gathered will be highly confidential and purely for academic purpose.

Direction:

- No need to write your name.
- Write your answer on the space provided.

Thank you in advance for your time.

1. While buying sesame, have you ever been cheated with mixed up sesame seeds with different sources of varying quality?

   ……

2. Have you ever come across with quality problems in sesame trade?

   …….

3. Have you been affected by the managerial bureaucracy?

   ……

4. How do you get the price information?

   ……

5. Where do you get market information from?

   ……
   ……

6. How costly is the transaction and service cost of sesame?

   ……
   …….

7. So far have you ever faced a contract, payment or delivery default?

   ……

8. What are the major problems identified in sesame marketing?

   ……

9. How fast is the payment clearing system when u deal at ECX?

   ……

10. Do you use electronic payment method?

    ……

Thank you for your valuable input and kind cooperation.