Comparative Study on Current Trading System and Online Trading: The Case of Ethiopia Commodity Exchange

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Abstract

The Ethiopia Commodity Exchange [ECX] is an organized market place that brings buyers and sellers to trade standardized contracts using its floor based trading system. The fundamental factors to establish successful commodity exchange includes having an efficient and robust trading platform. The focus of this research is to analyze the economic significance and limitations of the current trading system and assess the prospects and challenges of online trading and factors affecting its feasibility of implementation in ECX. The study used a mix of quantitative and qualitative research method to collect and analyze data relevant for the study. Questionnaire and in-depth interview were used to gather relevant data for the study. The study collected data from 375 members and clients out of which 279 are found to be good for analysis. In-depth interview was conducted with experts. Descriptive statistics was used to analyze the data. The study found that there is significant capacity problem with major skills gap with traders. The current system has its own significance in balancing the power of negotiation of traders by disseminating reliable data, and limitations in lack of market integrity, poor price discovery mechanisms and limitations in session and ticket writing times. It also found that there is good perception towards online trading system. Moreover, the exchange expects transparency, greater market oversight, market integrity and more commodities by deploying online trading system and challenges mainly infrastructural problems, and capacity of traders. Based on the findings, the paper recommends deploying an integrated surveillance system, reasonable allocation of session time, awareness on rules, in-depth training of staff and traders and building a redundant system were recommended for both trading systems accordingly.

Keywords: *Ethiopia Commodity Exchange [ECX], Floor Based Trading, Online Trading*

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1. Introduction

1.1. Background of the Study

One major factor associated with the produce of agriculture sector is the seasonality in supply. However, the demand of the commodity is spread over the whole year (Nigussie, Tanner, and Twumasi, 2011). Hence, a system of trading to ensure continuous supply of seasonal agricultural crops has evolved. Chicago, one of the original birthplaces of modern futures trading, was anideal location for commodities trading due to its close proximity to farmland. Chicago has long boasted two of the world's oldestcommodities markets: theChicago Board of Trade (CBOT), founded in 1848, and the Chicago MercantileExchange, CME, originally started as the Chicago Butter and Egg Board in1898. These markets helped bring together buyers and sellers of commoditiesin one designated area, thus making it easier to find someone to trade with. And standardized contracts called futures started to be traded (Gorham and Singh, 2009).

Instruments or contracts traded on commodity exchanges include futures, options and other derivatives. Trading in these instruments began with floor trading, also called open outcry systems. In open outcry systems, traders assembled in a pit in the exchange and traded commodities by indicating their bids or offers to others in the pits. Commodity futures markets help with price discovery and provide a way to hedge for producers and buyers of commodities. However, commodity trading has moved to electronic trading from open outcry systems, following the trend in financial securities trading (Thomas, 2008).

Pit trading and online trading are the two major methods of trading used by traders trading financial products and commodities. Pit trading also known

as floor trading is the trading of stocks or commodities manually in the exchange trading floor. It was the main type of trading until late 1990s. But the introduction of online trading of stock and commodities have certainly lowered the popularity of pit trading and now more and more pit traders are moving to electronic trading system (Gorham and Singh, 2009).Online trading empowers the market at large by providing online access to the market where members and their respective clients, in particular, can submit orders and/or view status of their orders. This eliminates any misunderstanding regarding the client's instruction to the member while providing visibility to trade status and execution for both the client and the member (Gastineau, 2010).

1.2. Statement of the Problem

Even though in most exchanges trades take place in electronic trading, Ethiopia Commodity Exchange (ECX) has started its operation with the introduction of floor based trading with spot contracts that are traded for immediate payment and delivery. The existing open outcry trading system at the headquarters restricts the market expansion potential of the Exchange, restricts the direct participation of large number of market actors located at the remote parts of the country at both the supply and export end. It is impractical to accommodate all trade sessions in one trading floor at ECX headquarters as more commodities are added. While more trading floors can be built, the more economical and sustainable option will be to provide online trading platform and allow trading from anywhere. The flexibility to set longer trading session time to maximize the chance for trading to get best value for commodities is hampered by the inherent space and time limitation of the current open outcry system of the Exchange (ECX, 2010).If the exchange devises a mechanism to facilitate remote trading through

online trading system, as stated in its rules (ECX, 2010-Article 5) these market actors can make a significant contribution to the trading volume and liquidity of the exchange.

According to the revised rule of the Exchange, there are efforts and monitoring/surveillance mechanisms being implemented and in place to monitor the market, in the current floor trade which is conducted at the ECX; however it continues to remain as a challenge to eliminate possible collusion and other incidents, including deliberate entry of different transactions on the tickets from what has been agreed up on the floor during the trade session, trades being submitted on the tickets for transactions not "shouted out" on the floor during the trade sessions, and market manipulation behaviors by market participant or a group to deceive in prices or volume of a commodity (ECX, 2010).

As market actors in floor based trading like the one at ECX are facing extensive physical strain, slow order of entry and execution, not being able to trade in multiple products and exchanges simultaneously, not being able to get instant market data as charts and instant news on same time, the time for having online trade is inevitable. Moreover, the actual owners of the commodities traded, known as clients are not having direct access to the market independent of brokers as the existing central trading floor restricts the direct participation of large number of market actors located at the remote parts of the country both at the supply and export end, they donot have instant and speedy access to their accounts, and they are not also the decision makers regarding the basic trading components like price and quantity. Solving the stated problems would enhance the prospects of online trading. The recently published newspaper (Media & Communication Center, 2013) which presented clients complaints on such incidents

canbeevidence. The clients have complained on the transparency and reliability of the members who execute trades on their behalf. Such related incidents are presumed to be significantly reduced, if not eliminated, with the implementation of online trading.

This research paper has attempted to analyze the practice of commodity trading at the Exchange floor market and the related challenges that are encountered due to the absence of online trading that facilitates market actors' potential access to the market where they can directly submit orders and/or view status of their orders. Still, introducing electronic trade in Ethiopia requires a lot of effort. In this view, an attempt has been made to identify the fundamental requirements for the introduction of online trading along with its potential benefits and challenges.

Based on the above statement of the problem, this study attempted to address the following basic research questions.

1. What are the economic significanceand limitations of the ECX floor based trading model to market actors?
2. To what extent can an online market be feasible in Ethiopia in terms of various factors?
3. What are the potential benefits of online trade to the exchange in general and the market actors in particular?
4. What are the challenges of implementing online trading at Ethiopia Commodity Exchange?

1.3 Conceptual Framework

Building on the preceding literature and borrowing ideas and concepts from Lau, Yen, and Chau, (2001), on adoption of online trading in commodity exchanges; Eleni (2006), on floor based trading and UNTCAD report (2009) on commodity exchanges, theresearchers constructed a model to achieve the objectives of the study. According to Eleni (2006), the fundamental factors to establish successful commodity exchange includes having an efficient and robust trading platform and viable regulation and enforcement. A comparative study by UNCTAD (2009) on commodity exchanges also stress the wide range of development impacts exchanges may have on developing countries in terms of price discovery, risk management, development of commodity markets and finance,market internationalization and use of IT services stressing on price discovery. Lau et al. (2001) studied the social/organizational perspective to identify the factors that affect investors' adoption of online trading. They identified that the decision to use the online trading system is influenced by the perceived usefulness, relative advantage, perceived ease of use, and compatibility.

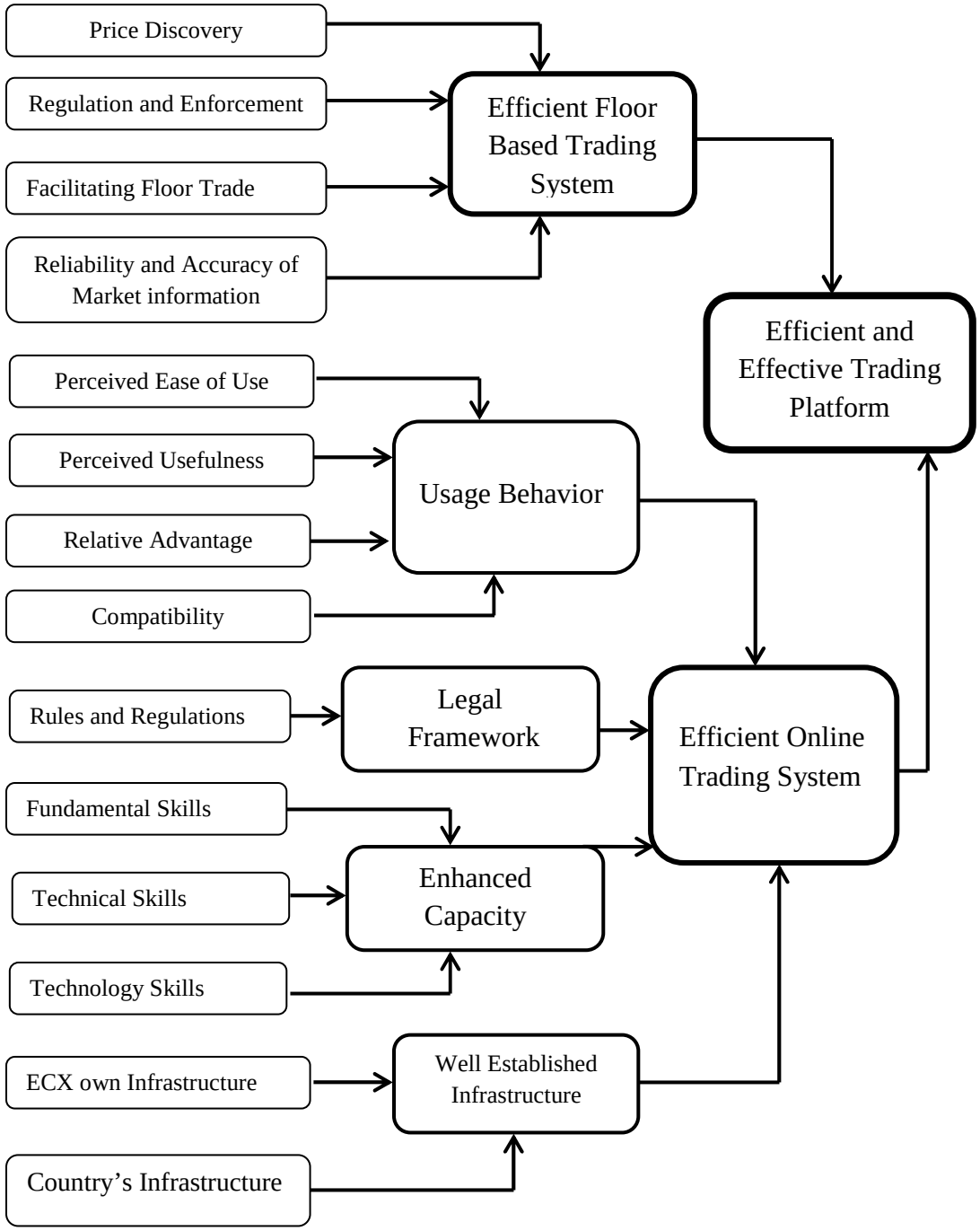

Figure 1. Conceptual Framework to guide this study

Source: Researchers' SchematicDesign (October2014)

2. Research Methods

2.1 Research Design

The researchers used a combination of descriptive and exploratory research methods. Descriptive method is set out to describe and to interpret what is going on. Descriptive research will help to analyze the existing trading practice at ECX floor based market. In addition, it helps to show the relationship between the floor based trade and online trade. Furthermore, the study has used exploratory research approach to explore the challenges, prospects and feasibility of the online trading system.

2.2 Population

The target population for the study was ECX members and their clients in selected regions. The population size was determined based on the number of members at the ECX Headquarters and their clients in applicable regional cities. As of June 30, 2014, ECX has 346 members (intermediary = 323 and trading = 23) and 13,543 clients. Clients from Addis Ababa, Adama,Assosa, Bedelle, Bonga, Bure, Dilla, Dire Dawa, Gimbi, Gonder, Hawassa, Humera, Jimma, Kombolcha, Metema, Nekempti and WolaytaSodo cities are considered for the study as the Exchange has warehouses in these regional towns(www.ecx.com.et). All coffee, sesame and pea beans traders were considered for the study as these commodities are traded as mandated ones at the Exchange on daily basis.

Since the clients' information is vital and not only helped in identifying the challenges and feasibility of the new system but also helped in identifying the significances and limitations of the pit trading. This has instigated the need for considering 13,514 clients (categorized based on the commodity

type they trade: Coffee = 5,840; Sesame = 6,238; and Pea beans = 1,436) as a target population. Thus, a total population of 13,860, which is comprised of 346 members and 13,514 clients, was considered for the study.

2.3. Sample Size and Sampling Techniques

Applicability of ECX regional delivery centers for the study was determined by the fact that the selected towns were selected by the senior management of the Exchange as future online trading centers (Yewondwossen, 2014). Thus, the selected regional towns are representative regional warehouses for the study, as they are all handling the three commodities that are traded at the Exchange trading floor.

The choice of sample size is governed by the confidence level and confidence interval the researchers need; the type of analysis to be taken and the size of the total population. Taking these competing influences the final sample size is a matter of judgment and calculation (Saunders, Lewis, and Thornhill, 2009). In addition, Saunders et.al, (2009) recommended the use of an expert systems such as Ex-Sample™ to calculate the appropriate sample size. The software calculates the minimum sample size required for different statistical analyses as well as the maximum possible sample size given resources such as time, money and response rates. Given the population the researchers took in to consideration the software calculated 374 as the appropriate sample size with a 95% confidence level and confidence interval of 5.

As an alternative in calculating the sample size,formula developed by Taro Yamane (1967) was also used. Yamane (1967) provided a simplified formula to calculate sample sizes. This formula was also used to calculate the sample size.

$$n = \frac{N}{1 + N\,(e)^2}$$

Where n= the sample size

N= the size of the population and

e =the error of 5 percentage points

A sample of one hundred members from the Exchange headquarters and 275 clients from regions (55 each)were taken as representative sample, these towns are presumed to have relatively similar level of knowledge about the floor based trading as they do not have direct market access to the trading floor and online trading, and given questionnaires to fill out in order to get their perspectives on the current floor based trading system and online trading system. This resulted in a total of 375 questionnaires that were distributed to the selected sample group from the target population. With regards to sampling techniques, random sampling was used to select the sample from the population of all members and clients who are trading mandated commodities: coffee, sesame and pea beans. The rationale for this sampling technique was that, all members and clients were expected to have a relatively similar level of understanding of the floor based system and online trading system and were randomly selected for the purpose of the study.

2.4. Data Collection Tools

The researchers collected data from different sources using various data collection tools. Questionnaires were distributed to randomly selected active members and clients of the Exchangewhere from distributed 375 questionnaires 87% collected but 74% used. In addition, in-depth interview was conducted using semi-structured interview with experts working at ECX, National Exchange Actors Association (NEAA) and Ethiopia

Commodity Exchange Authority (ECXA). Secondary data wasalso collected through desk research to clarify most of the issues.

2.5. Reliability and Validity

In order to ensure validity and reliability, the questionnaire was composed of carefully constructed questions classified in to clusters to avoid ambiguity and in order to answer all the research questions. The questionnaire and interviews designed for the study were reviewed and commented by experts working at ECX. These processes helped to ensure the content validity of the instrument. Moreover, the result indicated that the internal consistency is rated as 0.734 as measured by Crombach‘s alpha coefficient which shows that the instrument is well enough consistent (Pallant, 2005).

2.6. Methods of Data Analysis

After collecting and sorting the relevant data using data collection tools, quantitative responses have been sorted, coded, computed, and analyzed using SPSS version 20. The appropriate statistical analysis is used according to respective objectives and descriptions. The analyzed data is presented using tables which is the output of the software. The qualitative data collected from experts is also analyzed using content analysis.A Likert scale of 5 has been used where 5 is used as a lowest value and is assigned to strongly disagree or poor, whereas 1 is the highest value, assigned to strongly agree or excellent.

3. Results and Discussion

3.1 General Profile of Respondents

Of the total respondents 172 (61.6%) of the respondents are clients, where 89 (31.9%) are intermediary members and the rest 18 (6.5%) are trading members. As the online trading platform is expected to benefit mainly the clients, traders who do not have direct market access to the trading floor, the share of clients among respondents is managed to be high. With regard to the experience of trading in commodity exchanges, 73% of the respondents have more than 3 years' experience in trading at the Exchange trading floor. As experience of trading in exchanges can be helpful in introducing a different trading platform with similar trading rules and regulations having 73% of the respondents with more than three years of experience is good for the Exchange to use their experience and built on it.

From the analysis on educational background of respondents, it was found that 72 respondents (25.8%) have primary school level, 60 respondents (21.5%) are high school dropouts, 70 respondents (25.1%) are high school graduates, 50 respondents (17.9%) are diploma holders and the rest 27(9.7%) have first degree or above. This profile shows that majority of the traders have not even completed high school. The educational background of respondents could be enough for the floor based trading as it is relatively easy, with full of information on the status of the market dynamics as every buyer and seller is trading together in the same trading pit. However, having more than 72% of traders with high school complete and below qualification, could be a serious challenge to the proposed online trading system. This shows that the Exchange must work hard to build the capacity

of its traders and make them certified electronic traders if it does not have any alternative traders.

3.2. Floor Based Market Functional Dimension

The study measured opinion of members and clients towards the efficiency of the floor based trading by taking five major aspects of the Exchange's floor based market. A total of 21 item questions: 7 for regulation and enforcement, 6 for facilitating trade, 4 market price discovery, and 4 accuracy and reliability of market information dimensions were used for the study.

3.2.1. Regulation and Enforcement

One of the functional dimensions used to measure the ECX floor based trading is regulation and enforcement. This dimension measures the knowledge of members and clients towards ECX trading rules, the effectiveness of the surveillance system employed by the exchange, and the effectiveness of compliance system to monitor trading rule violation. Accordingly, there are encouraging signs for ECX that the regulation and enforcement functions are good with a mean score of 2.79. The regulation and enforcement dimension is fundamental as it is one of the determinants of the floor based market. As can be seen in table 1 below, respondent's knowledge on the contracts traded at the Exchange trading floor, knowledge on trading rules and regulations, knowledge on the order types availed at the Exchange trading floor and execution rules is relatively good. These are the very basic regulations that should be understood and followed at the Exchange trading floor.

The study revealed that respondents are well aware of the contracts that are

traded at the Exchange trading floor, with 84.6% of respondents having good knowledge. 71.3% of respondents responded that they have good and above knowledge on order types and execution rules and on trading rules and regulations that the Exchange applies in running the floor based trading. The result gives a good sign that members who have direct market access to the trading floor and clients who are expected to have this privilege when the online trading platform is availed having a good knowledge of the stated determinants can easily integrate themselves in the online trading platform.

Table 1. Regulation and Enforcement Variables

Regulation and Enforcement	N	Mean	% of good and Above
Indicate your knowledge regarding the products traded at ECX.	279	2.50	84.6%
Indicate your knowledge regarding the ECX rules and regulations.	279	2.93	71.3%
Indicate your knowledge regarding the type of orders and order execution rules set by ECX.	279	2.87	71.3%
Traders deliberately submit trade tickets different than that of what is agreed on the trading floor	279	3.06	27.2%
Traders submit tickets for transactions not shouted out on the trading floor	279	3.11	24.4%
Surveillance system employed by ECX helps to monitor market manipulation by traders	277	2.47	57.8%
Compliance System employed by the Exchange helps to monitor rules violation	277	2.42	61.0%

One of the interviewees who is closely working in the trading operations explained the major contribution of the ECX Floor based market is its restructuring and organizing of the traditional marketing system and

bringing the trading system into modern institutional arrangement that facilitates trading in an orderly and regulated manner. The ECX trading model established the foundation rule for trading contracts in the country. Traders learned to trade based on rules and standards using an open outcry trading system. Before ECX came to the scene, traders have to have commodities physically to transact.

The other issues under the regulation and enforcement dimension were related to rule violation, market manipulation and the systems employed by the Exchange to deter and prevent rule violators from manipulating the floor based trading system. From the study performed only 27.2% of respondents believe that floor traders deliberately submit trade tickets different of what they have agreed on the trading floor. Moreover, only 24.4% of respondents believe that floor traders submit tickets for transactions not shouted out on the trading floor. This shows that members and clients believe there is less market manipulation related to submission of agreed tickets different from what has been agreed. As majority of the respondents are clients, who do not have direct market access to the Exchange trading floor, they may not be aware of such situations. But from the interview made with ECX experts, and data obtained from the Exchange, market manipulation related to submission of tickets different from what has been agreed is a critical problem at the Exchange trading floor. As per the finding of this study, the number of rejected trades (934 and 808 in year 2012/13 and 2013/14 respectively) due to market related issues[3] may seem to be insignificant compared to the accepted trades but is critical when compared to what the Exchange stands for. The Exchange promotes itself as a market with zero

[3] Market related issues encompasses market manipulation, buying without sufficient balance, submitting tickets different than what has been agreed and submitting tickets without any agreement.

defaults. Moreover, the same reason can be given for respondents 24.4% result on item traders submit tickets for transactions not shouted out on the trading floor. As noted from the interview conducted, experts explained that there is a physical surveillance mechanism to control such manipulations supported by surveillance cameras, but this is a challenge to the exchange as there is an attendance of more than 600 people on daily bases and the camera is an obsolete one. This brings challenges to market operators and market surveillance which has to put extra effort to monitor the market.

As table 1 above shows, 57.8%of respondents believe that the surveillance system employed by ECX helps to monitor market manipulation by traders, and 61% of the respondents agreed that the compliance system employed by the exchange helps to monitor rule's violation. This shows that from 39%-42.2% of respondents believe the surveillance and compliance systems deployed are not enough to control the market and deter market manipulators from engaging in such behaviors, and punish the rule violators accordingly. From the interview conducted it is also noted that there is a limitation from the Exchange side in controlling the trading floor. The limitations stated by experts are lack of staff with good skills in market surveillance in the job market, inability to use state of the art surveillance cameras and surveillance applications. Moreover, the experts at the ECX and ECXA believe that even though there are highly standardized rules and regulations. The actions taken on rule violators by the Business Conduct Committee (BCC) are not good enough to make the needed behavioral change.

3.2.2. Facilitating Trade

ECX facilitates trade at its trading floor, through open outcry trading system by designing trading sessions, allocating trading time and ticket writing time based on commodities and origins of these commodities. ECX administers a single trading floor that limits the capacity of the Exchange in trading different commodities at a time. As a result ECX has to limit the trading time of each session. The outcome of the study presented in table 2 indicates that respondents agreed towards the trading hours and schedules set by the Exchange to a higher extent by scoring 2.28 mean score. The lowest result is recorded in the time assigned for each session and ticket writing time allocated by the exchange with mean score of 3.01 and 3.11 respectively. This shows that the traders do not agree with the allocated time per session as it limits the trading time they need to hear what has been shouted at the trading floor, analyze it and decide on the components of the contract like grade, quantity and price. It also shows that the limited ticket writing time is barring traders from fulfilling their contracts that were executed during the trading time, which could lead to market manipulation and prearranged trades.

There is only one trading floor which accommodates more than 25 trading sessions on daily bases. The trading sessions allowed time depends on the number of traders on any session, according to an expert at ECX. The minimum time allowed for trading is 5 minutes and the maximum time allowed for trading is 15 minutes depending on the number of traders and liquidity of the session. As the expert noted, limiting the trading time and ticket writing time is in the interest of the Exchange in order to accommodate all trading sessions. But this issue has been a contentious issue for the last four years as one expert noted. As more commodities are

allowed to be traded at the Exchange trading floor it would be impossible to accommodate all in a single trading floor. The Exchange had started to build additional trading pit but construction was aborted, as the management thought it would not be a lasting solution and planned to introduce online trading system.In facilitating trade, the expert stressed that ECX provides market actors a secured platform for trading big volumes of commodities from one place. In doing so, the Exchange not only contributes to commodity trade but also provides other services which other exchanges normally do not render. Apart from trading spot contracts, the ECX provides such functions as: warehousing commodities, quality grading, payment service and delivery of commodity.

Table 2.Facilitating Floor trade variables

Variables	N	Mean	Std. Deviation
The size of the Exchange trading floor is enough.	279	2.90	1.11754
The ticket writing time set by the Exchange is enough.	279	3.11	1.17341
The trading time set by the Exchange for each trading session is enough.	279	3.01	1.16906
The trading hours and schedules and set by the Exchange are good for trading.	279	2.28	.93723
The overall condition of the trading floor is convenient for trading	279	2.65	1.12089

3.2.3. Accuracy and Reliability of Market Information

The accuracy and reliability of market information displayed at the Exchange trading floor price tickers is fundamental to the efficient and

effective running of the trading floor. ECX displays at its trading floor, contracts traded and their last prices; international reference prices like New York Board of Trade (NYBOT) Arabica 'C' prices; Chicago Mercantile Exchange (CME) prices for wheat and maize; and Nigeria, India and Sudan reference prices for sesame. On top of all these, the price tickers show the existing session's contracts with last closing prices, price ranges, executed prices, change from last closing prices and volume of traded contracts.

Table 3.Accuracy and Reliability of Market Information variables

Variables	N	Mean	Std. Deviation
I know the status of my orders or transactions instantly.	279	2.23	1.06501
The market information displayed at the Exchange trading floor is timely.	278	2.19	1.00589
The market information displayed at the Exchange trading floor is reliable.	279	2.15	.97149
The recording of executed trades at the Exchange trading floor is accurate.	278	2.20	.93221

As table 3 depicts, market information's accuracy and reliability responding replied overwhelmingly in a positive manner with the highest mean score of 2.15 on the questionnaire item '*the information displayed at the Exchange trading floor is reliable'* and the least mean score on item '*I know the status of my transaction instantly'* with a mean score of 2.23.The respondent's reaction in this regard shows that ECX is in a good path in recording and disseminating market information that is crucial for the floor based trading.

The interview conducted with the market data manager reinforces the results obtained in this regard, explaining that the reliability of the market information displayed on the trading floor is very critical to the smooth running of the trading floor in particular and the Exchange in general. The information that ECX at its trading floor while trade is going on and throughout the country in major cities enabled market actors to have balanced power of negotiation. The negotiating power of market actors facilitates price discovery. The dissemination of market data is closely linked to primary markets as it disseminates price information across major primary markets using price display board and other media of communication. One of the interviewees explained that, this contributes to the improved functioning of primary markets by providing information that allows market actors to make better and informed decision, and this ultimately results in fair distribution of income in the value chain.

3.2.4. Price Discovery

ECX aims to provide price discovery function in its floor based trading. Price discovery as a function of competitive bid and offers for price discovery, having sufficient buyers and sellers, market information dissemination contribution for price discovery and having a transparent price discovery mechanism are analyzed in the study. Table 4 revealed that respondents believe that *the market information disseminated facilitates price discovery* with a maximum mean score of 2.34 and a minimum mean score is scored with the item *the exchange has a transparent price discovery mechanism* which scored a mean of 3.15.The result showed that the price discovery mechanism that is employed by ECX at its trading floor is not an efficient one.

Table 4. Price Discovery Variables

Variables	N	Mean	Std. Deviation
The Exchange has a transparent price discovery mechanism.	279	3.15	1.30533
There are sufficient buyers and sellers at ECX floor based market	276	2.85	1.12639
There is competitive bid and offer for price discovery.	279	2.98	1.19933
ECX market information dissemination facilitates price discovery.	279	2.34	1.04284

As it was also noted from the interview, the behavior of traders in trading by pre-arranging trades that is fixing prices ahead of trading time, and lack of preventive mechanism by ECX, and collaboration of traders in covering such issues has affected the price discovery process that is deployed by ECX at its trading floor. Under the price discovery function, respondents believe that there are sufficient buyers and sellers in the trading floor to facilitate true price discovery, and there is competitive bid and offer for price discovery at the exchange trading floor with a mean score of 2.85 and 2.98 respectively.

The respondents mean score of 3.15 on price discovery is supported by the interview conducted. True price discovery, as described by an expert is highly dependent on the behavior of each and every trader who has access to the trading floor. Lack of true price discovery is one of the limitations of floor based trading system at ECX as price is manipulated by market actors. Traders, both sellers and buyers, are tempted to manipulate price through negotiating and fixing price outside of the market before they get into the trading pit- which makes price discovery difficult and thus is challenging the integrity of the market.

3.2.5. Overall Satisfaction with the Floor Based Trading

With regard to the overall level of satisfaction with the floor based trading, significant portion (48.4%) of respondents dissatisfied with a mean score of 3.07. This could be the result of what the study has revealed with regard to regulation and enforcement and price discovery. Respondents in the two major dimensions were not happy with the rules enforcement, market manipulation practices, and decisions that are taken by the Business Conduct Committee(BCC) on rule violators being not enough. In addition to this, the satisfaction with price discovery was also low. As one expert noted one limitation that ECX floor based trading model has is lack of price hedging tools as ECX only trades spot contracts. Moreover, the dissatisfaction could be the result of the absence of speculators, risk takers and hedgers on the ECX market which prohibits members and clients from managing their price risk. The trader noted that the floor based trading is resulting in increasing transaction costs, inefficient market price discovery, and speculative behavior of traders which affects the liquidity and integrity of the market.

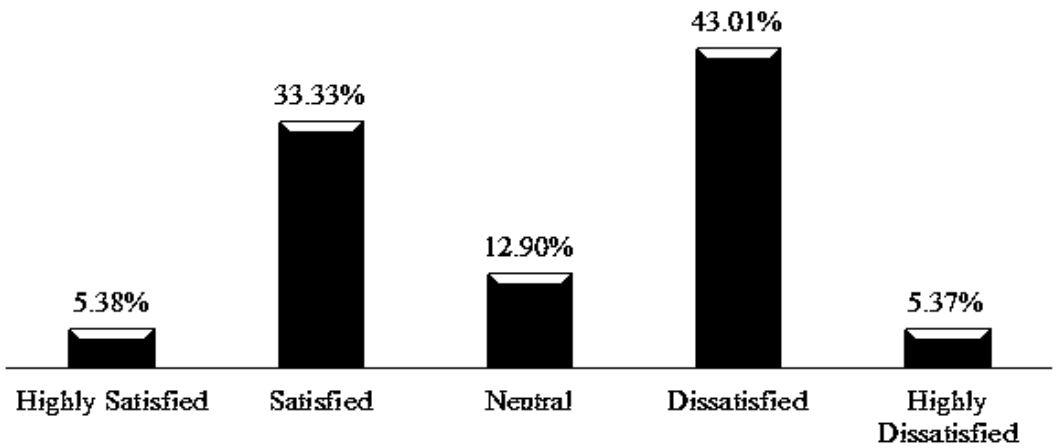

Figure 2. The percentage on level of satisfaction with Floor Based Trading

3.2.6. Correlation Analysis on Floor Based Trading System Dimensions

In order to test the relationships between various dimensions used in the study, correlation analysis was carried out. In this regard, Croft (1983) stated that undertaking of a correlation analysis is an essential step in the development and testing of a model.

Cohen (1988) suggests the following guidelines in interpreting correlation results:

r=.10 to .29 or r=–.10 to –.29 small

r=.30 to .49 or r=–.30 to –.49 medium

r=.50 to 1.0 or r=–.50 to –1.0 large

While all the floor based trading related dimensions (facilitating trade, price discovery, regulation and enforcement and reliability and accuracy of market information) are found to be significantly ($p<0.01$) associated with each other, significant positive associations are also obtained between the dimensions of overall satisfaction with the floor based trading system and facilitating trade(r=0.22), price discovery (r=0.21), regulation and enforcement (r=0.18) and reliability and accuracy of market information (0.26).

As can be seen from Table 5, with respect to the stated dimensions, the strongest relationship is found between the dimensions of reliability and accuracy of market information and price discovery (0.60) and medium relationship with facilitating trade (0.46).Moreover, relatively weak, though significant, relationship is observed between the dimensions of regulation and enforcement and facilitating trade (0.24).

Table 5. Correlation coefficient of floor based trading dimensions

Dimension	Overall Satisfaction with the floor based trading system	Facilitating Physical Trade	Price Discovery	Regulation and Enforcement
Facilitating Physical Trade	0.22			
Price Discovery	0.21	0.33		
Regulation and Enforcement	0.18	0.24	0.27	
Reliability and Accuracy of Market Information	0.26	0.46	0.60	0.33

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

3.3. Online Trading Related Dimensions

3.3.1.Online Trading Skills and Competency

Online trading skills and competency cluster was one dimension that was used to measure respndents capacity in this regard and define capacity building needs. Under this cluster fundamental and technical market analysis skills and proficiency in using online trading applications were considered. As table 6 shows, the mean score for the overall cluster is 3.44 which is below average. Respondents reply with regard to their skills in using online trading as a trading application scored 4.18 mean score. In this regard 55.9% of respondents proved to have poor skills.

Trading using an online trading platform requires sitting infront of a computer analyzing fundamental and technical data. As can be seen under section 4.1 above, the educational background of respondents show that morethan 73% of them are high school complete and below. Table 6 shows that the result mean score in the fundamental and technical skills is 3.72 and

3.73 respectively could be the reflection of the educational background of respondents.

The overall result showed the capacity gap in the respondents potential in trading using online trading applications.This result is supported by all experts at the Exchange and the regulatory body. All interviewees agreed stressing on the need for mandatory training on fundamental and technical skills. As the online trading platform gives access to clients, narrowing the capacity gap has enormous benefits.Failing to do so would expose traders to risks if not mitigated could result in financial risks or opportunity cost. As one expert from ECX noted, the risks could include wrong data entry, trading without understanding market prices, lack of understanding the market, and unintended trade order outcome.

Table 6. Online trading skill and competency cluster mean score

Variables	N	Mean
Indicate your knowledge and skill in using Price charts	279	3.03
Indicate your knowledge and skill in using Price patterns	279	3.11
Indicate your knowledge and skill in using Price trend lines	279	3.13
Indicate your knowledge and skill in using Price/Volume relationships	279	3.14
Indicate your skills in fundamental market analysis.	279	3.72
Indicate your skills in technical market analysis	279	3.73
Indicate your skills in using online trading applications	278	4.18
Online Trading Skills and Competency	278	3.44

3.3.2. Perceived Ease Use

The study also tried to see on the perspectives of traders towards online trading. The perspectives of traders affect their usage behavior and help the Exchange in knowing the expectations of traders and prepare itself for the future.Table 7 displays that respondents perceive if deployed the online trading platform would be easy to use with a mean scale of 2.54. Under this perspective, the perception that the online trading system would not be difficult to use scored a mean score of 2.49. Among respondents 27.2% are unsure on the usefulness with 19.4% totally disagreeing. This factor is critical and taking the neutral and disagreeing respondents which are 46.6% in to consideration, it could have a significant impact in using the online trading system.

One expert who was asked for comments in this regard replied that this could be a result of the traders experience in the floor based trading. The other items under this perspective, the perception that the system will be easy to get the system to do what you want to do, and the perception that learning to operate or master the online trading will have no difficulty scored relatively similar mean score of 2.59 and 2.53.

Table 7. Perceived Ease of Use Variables

Variables	N	Mean
The online trading system will not be cumbersome to use.	278	2.49
It will be easy to get the system to do what you want to do.	279	2.59
Learning to operate or master the system will have no difficulty to me.	279	2.53
Perceived Ease of Use	**278**	**2.54**

3.3.3. Perceived Usefulness

Perceived usefulness was also part of the study. As table 8 presents, this perspective measures the perception that online trading system could improve their performance in trading, scored a mean score of 2.23 with 71.7% respondents replying with agree and strongly agree. This shows that especially those respondents who do not have direct market access to the Exchange trading floor, could be beneficiaries and improve their performance. As one expert said during the interview, online trading systems can improve the liquidity potential of ECX through lower trading costs for clients. The online trading system will help ECX to attract new sources of liquidity by providing affordable remote access to traders.

Table 8. Perceived Usefulness Variables

Variables	N	Mean
Using the online trading system will improve my performance in trading.	279	2.23
Using the online trading system will increase the profitability of my company.	279	2.32
Using the online trading system will enhance my effectiveness in trade.	279	2.23
Doing trade (business) online is safe.	279	2.59
Perceived Usefulness	**279**	**2.53**

The perception that online trading will improve my profitability also scored a good mean score of 2.32 with 65.2% of respondents agreeing on the profitability that could be attained by using the online trading system. This result is supported by the interview, as one expert stated one of the benefits of using online trading is lowering transaction cost which is also

substantiated by the literature. Online trading systems would be less costly to operate and may, therefore, offer lower bid–ask spreads. The online trading system will help to lower operating costs which include the direct transactions costs or commissions and the indirect costs like lost revenues due to illiquidity or a lack of market depth. And this trading system is also good to the Exchange as it requires less labor and time. The expert compared the open outcry system to the online trading system, and said that the open-outcry systems entail greater fixed costs due to the need to employ a greater number of personnel which could have a direct impact on the profitability of the Exchange and indirectly on traders.

The overall mean score for perceived usefulness is 2.53 which are affected by respondents' uncertainty on the safety of trading using the online trading application which resulted in a mean score of 2.59. Only 50.2% of respondents believe that trading using the online trading is safe. 31.9% of respondents which is a significant number replied as neutral which reflects their uncertainty. This uncertainty can be supported by the uncertainty in the availability of infrastructure, and technology bugs that can hinder the smooth running of the online trading system as noted from the interview.

3.3.4 Compatibility

Compatibility is the degree to which an innovation is perceived as being consistent with the existing values, needs and past experience (Rogers, 2003). In this regard, two items were part of the questionnaire. The overall mean score for compatibility is 2.44 which is a good result. The perception that the experience respondents have in trading using floor based trading will help to use the online trading system is good with a mean score of 2.36. More than 67.4% of respondents replied with agree and strongly agree. This

result means that the experience in trading contracts, knowledge of rules and regulations, knowledge of using market information for decision making will clearly help them when they trade in the online trading platform.

As one of the experts at ECX revealed saying “we are only changing the trading platform, and giving better access to the clients. There is no new rules and regulations that is capable of creating any confusion in the market” This supports the respondents belief, however 18.6% of respondents are neutral on this, as they are not well aware of what is to come with online trading. The other perception under the compatibility perspective is the perception that placing orders with the online trading system will be better than the current system. The perception scored2.51 mean score, with 41.9% respondents replied ‘agree’ and 14.7% of them with strongly agree. Another significant portion of respondents, 26.9% remain neutral on this.

Placing orders in the current trading system is done through registering their orders with the member trading at the exchange trading floor. As noted by an expert the decision to sell or buy, what to trade, when to trade and with whom to trade, all these decision are made by the members and their floor representatives only. However, this could be changed with the introduction of online trading which empowers market actors especially clients to put their instructions and orders directly in to the system.

3.3.5 Relative Advantage

Relative advantage according to Rogers, (2003) in the degree to which an innovation is perceived as better than the idea it supersedes. This perspective was also part of the study by measuring the respondents’ perceptions. Three perception items were prepared and the perception that online trading is good for clients to put their orders compared to the current

practice was also one of the questionnaire items availed. The mean score for this perception item is 2.33 with 66.3% of respondents agreeing to it. 20.4% of respondents remain neutral, only 13.2% disagreed. This perception is also shared by the Exchange. Changing the order placing in the online trading system could lead to a better price discovery and market efficiency.

As the market data expert noted, online trading system would enable actual owners of commodities to decide on the offer price. This helps the Exchange to improve the price discovery process as orders can be entered faster into the system by actual owners of the commodities and the execution of an order is immediate. Further, it is easier to disseminate market information, thereby increasing the transparency of the market and the information available to the traders.

The perception that the online trading system would create better market access to market actors scored better with a mean score of 2.29. 71.3% of respondents said ‘agree’ and ‘strongly agree’. As mentioned above the lack of direct market access is a big concern the current model of trading and the respondents need is clearly manifested in this result. The actual owners of the commodity or cash would be the ones who make the decision on the price and timing of their trades. As can be seen here and the previous results of other dimensions, there is significant portion of respondents replying as neutral. This means that the Exchange should work on creating awareness. The outcome with significant portion of respondents agreeing to this perception is clearly substantiated by interview conducted and literatures that stated the online trading platform would empower the actual owners of the commodities not brokers.

3.3.6. Correlation Analysis on Online Trading Dimensions

A correlation analysis was also conducted to determine the relationship between the perception of traders towards online trading and usage behavior. Table 9 shows the results of the analysis done. A close examination of the correlation coefficient indicates that usage behavior has significant relationship ($p<0.01$) with perceived ease of use (0.57), perceived usefulness (0.72), relative advantage (0.73) and compatibility (0.73). As can be seen from table 9, there is a significant and strong relationship among the perceptions, with the highest score of ($r=0.77$) between compatibility and perceived usefulness.

Table 9. Pearson Correlation Coefficient among online trading perceptions

Perceptions	Usage Behavior	Perceived Ease of Use	Perceived Usefulness	Relative Advantage
Perceived Ease of Use	0.57			
Perceived Usefulness	0.72	0.79		
Relative Advantage	0.73	0.59	0.67	
Compatibility	0.73	0.66	0.77	0.68

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

3.4. Potential Benefits and Challenges of Online Trading to the Exchange

Interviewees were asked what would be the prospects of introducing online trading to the overall market. All interviewees suggested that, introducing an online market in Ethiopia is inevitable. They noted that the industry trends indicate that online trading will be the de facto means of trading at all exchanges in the future. Staying with the industry trends does have benefits particularly as Ethiopia aspires to be a world class and well recognized

exchange in the world where ECX can be used as reference market for some of the commodities traded such as sesame. The online trading platform also facilitates for regional and global integration with other electronic exchanges in the future.

According to the experts at the Exchange, the major benefits sought can be classified in to two: Short term and long term prospects. Most of these benefits and challenges are analyzed with regard to the market actors, the specific short term and long term benefits that ECX can capitalize from introducing online trading are discussed below.

Transparency: The electronic trading system would increase the amount of publicly available information by transparently displaying and efficiently archiving quotes, depths, orders, and transactions. Market information would be disseminated to market actors in real time. With electronic trading, the system will simply queue the orders and match them using a matching algorithm where the prices discovered would be published on the computer screen.

New Commodities: The electronic trading model would help ECX to launch new products in the future. It would be far easier for ECX to introduce new contracts than it is in the floor-trading system. The Exchange no longer has to worry about the physical space and the added time schedule needed for the new product. Technology will allow ECX to experiment with innovative products and see what works without adding significant cost. The increase in product choices will help ECX to grow its overall volume tremendously in the years to come.

Greater Oversight of Trading Activity: ECX compliance officers, market surveillance managers and market operators task of monitoring and risk

controls will be further enhanced as they can obtain accurate and timely information on real time basis. In the electronic trading model, there is an audit trail of virtually every mouse or keyboard click a trader makes. Whether it is the time the order was submitted, the account information, the fill time, or the number of changes made to the order, every single event is recorded and stored.

Market Integrity: As a self-regulator, ECX can track all electronic trading activities to analyze trading patterns and discover any violations of rules. Market surveillance for floor-trading is hard to monitor and capture trading violations, especially in real time. To capture a larger trade violation, one has to actively monitor trading activity for days, weeks, and sometimes months to uncover violations. In electronic trading, every trade, along with the details, is captured and stored.

The long term benefits of introducing online trading as identified by ECX experts would include:

Expansion potential: Electronic trading will provide ECX ample opportunities to scale up its operations by way of enhancing its capacity to introduce new instruments, to launch new contracts, and to adapt to new models.

Regional Integration: As the exchange transforms from the floor-trading model to the electronic trading model, it will begin its journey toward regional integration. The increase in volume provides the Exchange with increased revenue, which in turn will allow it to further strengthen its product offerings by forming partnerships with more exchanges.

Moreover, ECX operations will be much more efficient in terms of cost and service delivery. The amount of paper (in thousands during peak season) that get produced including Member Client Position (MCP) report, Floor Representative reports, Delivery Notice (DN), and Net Obligation Report (NOR) on a daily basis will be eliminated including all associated labor costs to distribute and handle these documents, and the space requirements.

In addition to the already discussed challenges one of the challenges identified by interviewees was the legal frame work. They stated that the current rules of the Exchange in general and article 5 (Trading on the Exchange) in particular were designed for floor based trading only. Revising the rules of the Exchange falls under the compliance unit with approvals from the regulatory body. Reviewing each article of the rules of the Exchange across all operational and legal perspectives would be a big challenge. One of the major changes in the rules would be allowing clients to have direct access to the electronic trading platform.

The other challenge noted by the experts of the Exchange was related to the IT infrastructure within the Exchange. The reliance on technology will significantly increase. This requires strengthening and building multi-layered redundancy and robust processes to ensure business continuity at all mission critical levels of the operation. With lack of qualified professionals in the market and technology glitches, and infrastructural problems, past record of 100% up time of ECX trading platform may not be achievable with the online trading system.

Interviewees also noted other operational challenges that would be encountered if the Exchange is going to have an electronic trading platform. From the interview, the challenge with which commodities to start: coffee,

sesame, pea beans or all. How to manage the sessions, is it going to be side-by-side with the floor based contracts, or one after the other that is online then floor or floor then online, and the third alternative which is selecting specific contracts to be traded exclusively through online platform. Furthermore, the calculation of last closing prices of contracts traded is expected to be another challenge as it is going to be based on prices obtained from the trading floor and online trading platforms.

4. Conclusion and Recommendation

4.1 Conclusion

From the general profile of respondents, it can be concluded that ECX as an Exchange that is expected to follow suit of its international predecessors, has serious capacity related problems with its traders. This result can be taken as one of the reasons that the Exchange trading floor based trading is inefficient. Moreover, it can also be concluded that there is absence of qualified traders for the online trading system that is expected to be the de facto means of trading in the future.

Under the regulation and enforcement, the overall result showed relatively good mean score. Here it can be inferred that members and clients have very good knowledge of contracts traded, rules, regulations, order types and order execution rules. In addition to these, the regulation and enforcement dimension measured different aspects of the floor based market integrity, surveillance and compliance mechanisms deployed by the Exchange.From the analysis it can be concluded that there is market manipulation by traders who have good knowledge of all the trading rules and regulations of the Exchange. This behavior is aggravated by the absence of professional market surveillance staff and lack of state of the art high definition cameras.

The second dimension is the facilitating trade dimension which was studied from different perspectives. From the results obtained it can be concluded that the Exchange has well thought trading hours and schedules that are designed to facilitate trade in relation to the international markets. However, it is also concluded that the Exchange's trading floor is not good enough for some sessions with big number of traders. It is also concluded that the trading time assigned to each session and ticket writing time given after each session is not enough.

The third dimension under study was the market information accuracy and reliability. This dimension is the one dimension with the highest mean scores. From the analysis performed, it can be implied that ECX is displaying reliable market information that is accurately recorded by its staff on time during each session. It can also be concluded that the traders reliance on the market information recorded, displayed, and disseminated is high.

The fourth dimension is the price discovery dimension. In this regard, most respondents do not agree with the notion that the Exchange has a transparent price discovery mechanism. Significant number of respondents has concerns with having enough number of buyers and sellers in the market. Similar number of respondents also showed their concerns on the floor based market's lack of competitive bid and offer for price discovery. From the results obtained it is concluded that the Exchange's price discovery mechanism is very poor which could be affected by lack of enough buyers and sellers in the market who can provide competitive bid and offer. Furthermore, with regards to the overall satisfaction of the floor based trading it can be concluded that members and clients are dissatisfied with the overall floor based market. This dissatisfaction can be an extension of

the concerns stated above with facilitating trades, regulation and enforcement, and transparency in price discovery.

The general skills that are related to online trading were also analyzed in the study. From the study findings it can be concluded that there is a huge capacity gap in using computers and computer related functions that are the basics for trading using online trading system. The online trading skills and competency of members and clients was also analyzed. Findings revealed that respondents experience in using online related electronic trading, electronic payment applications and functions has the least mean score with poor results. On top of this, respondents'level of knowledge in the fundamental and technical skills is very low. These skills arecritical in trading using the online trading system. As capacity gap is critical here, it can be said that the overall online related skills and competency is not good enough for the implementation of online trading. There is also a skill gap among traders which can create an imbalance in the fairness of the online trading platform. However, from the findings it can be concluded that the traders perceive the online trading system will be easy to learn and operate, easy to use and do whatever they wanted to do in trading. From the perceived usefulness perspective it is concluded that traders are expecting benefits with improved performance, effectiveness and increase their profitability with using the online trading system.

The perception of compatibility of traders experience in trading with the online trading system was also studied. From the findings, it can be concluded that traders perceive that their experience in trading on the trading floor will help them in trading using the online trading platform. Their knowledge in contracts, rules and regulations would be a plus in using the new platform. Moreover, from the perception they had in placing orders

using the online trading system it can be concluded that they are underprivileged with the current system's order placing mechanism. From the findings on the relative advantage perception, it is concluded that traders perceive that they will have better market access, with changed order placing mechanisms. This perception is also useful to the Exchange as it helps in getting true price discovery and market efficiency.

From the finding in usage behavior perceptions, it can be concluded that members and clients have a strong belief that they will be part of the online trading platform in the future. And as the Exchange will be able to provide accurate, current, relevant and sufficient data in the trading screens, traders can easily react to changes more quickly. The research also studied the infrastructure capability for trading using online trading systems. Only a third of the respondents believe that there will be good infrastructure for trading. From this and findings of the interview, it can be concluded that infrastructure problem especially with telecom services is a big concern for the traders and the Exchange. Finally, it is also concluded that if the online trading system is implemented the Exchange will benefit with better transparency in the market, new commodities can easily be added in to the system, the Exchange will have better market oversight as every move or click is registered, which could result in better market integrity.

4.2 Recommendations

4.2.1 For Floor Based Trading System

Based on the analysis, subsequent findings from the study and conclusion, the following recommendations are forwarded which the Ethiopia Commodity Exchange would consider in its attempt for improved utilization of its floor based trading system to the benefit of all market actors and

stakeholders in the value chain. These recommendations are believed to provide feasible solutions for the program.

- In order to minimize the trade related violations the exchange should deploy an integrated market surveillance mechanism that is supported by high definition cameras that can trace trader's activities. The exchange should also train its staff with market surveillance concepts techniques that could help them identify market manipulation behaviors beforehand and build the tersest of market in the surveillance system in particular and in the overall market in general.
- The Exchange market operators should work hard to enforce the rules of the Exchange that require open outcry system for the competitive bid and offer and transparency. The BCC should penalize rule violators in a manner that could make them learn from their mistakes and deter further violations.
- Trading session is a specified period of trading during which a single contract or group of contracts will be traded. In this regard, the Exchange should come up with a fairly distributed time that allows each session to accommodate all trades. And the ticket writing time should be reconsidered at least to accommodate the execution of all agreed trades.
- With regard to market information accuracy and reliability, the Exchange is well accepted by all its stakeholders. But the Exchange should also think of better market information disseminating tools like short message service (SMS) and Interactive Voice Response (IVR) to all stakeholders to help traders make informed decisions and balance their power of negotiation.

- In order to improve the price discovery mechanism, the Exchange should aware the traders and enforce the rule regarding the open outcry system that should be respected by all, and introduce mechanisms that could create better competitiveness while trading in the trading floor.
- In order to boost the satisfaction level of members and clients the Exchange should work closely with the NEAA in creating awareness on ECX rules, regulations and compliance mechanisms. Long lasting solutions that can minimize the transaction cost, enhance market integrity and improve the price discovery mechanisms should also be considered by the Exchange.

4.2.2. For Online Trading System

Based on the analysis, subsequent finding from the study and conclusion, the following recommendations are given which the Ethiopia Commodity Exchange could consider in its effort to introduce the online trading system.

- In order to empower members and clients of the exchange, in-depth training and capacity building programs should be designed and implemented to all stakeholders. The Exchange as market operator should take the leading role in developing its staff and equips them with the necessary input. Exchange staffs in the market surveillance and trading operation units need to be well aware of the fundamental and technical tools in addition to the rules and regulations. The regulatory body also needs to upgrade its staff with the necessary knowledge as things would significantly change from pits to bits. With online trading, it is with deep analysis that the Exchange and ECXA the regulatory body that can identify any market

manipulations or fraudulent behaviors of market actors. In order to do so both parties should focus on need tailored capacity building programs that could help them run and monitor the market efficiently.

- Furthermore, as seen in the findings the capacity problems of members is undeniable and needs due attention and highest priority. Intensive class room based awareness programs and online trader certification programs should be designed before allowing market actors to access the online trading platforms. Trainings on the fundamental and technical skills should also be given to all market actors in order to create a relatively balanced state of knowledge.
- Regarding the infrastructural problems faced, the Exchange with the help of donors should build its online trading centers with multiple layers of redundancy to avoid downtime related to power outages and to significantly reduce the downtime associated with telecom outage by installing redundant connectivity options including fixed line broadband and wireless connections. The same approach should be employed to avoid failures at local area network (LAN), local IT asset level and the central data center locations. And in order to guarantee power the use of uninterrupted power supply (UPS) and generators is highly recommended.
- To address the legal issues identified from the findings, the Exchange should incorporate a team of experts from the information technology, compliance and operations divisions to craft the legal framework. The Exchange as a self-regulatory entity is ruled by the rules of the Exchange. The rules should be revised and additional rules concerning online trade should be incorporated as deemed

necessary, standard trading terms in contracts should also be modified with all their risk management tools.

- The operational issues are very critical issues that are expected to be faced by the Exchange once the online trading is implemented. It is recommended that the Exchange should consider its capacity to handle all commodities at a time. Very critical analysis needs to be done to identify the potential pros and cons of deciding on any alternative. Learning from the experience of other exchanges in session management and in calculating last closing price (LCP) is also suggested.

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