



**ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES
SCHOOL OF BUSINESS**

**PRACTICES AND CHALLENGES OF NEW AIRCRAFT ACQUISITION
PROJECTS: THE CASE OF ETHIOPIAN AVIATION SECTOR**

**BY
ASHENAFI TSEGAYE**

**JULY 2020
ADDIS ABABA, ETHIOPIA**

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**A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, SCHOOL
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LIST OF ACRONYMS

AABIA	Addis Ababa Bole International Airport
AFS	Abyssinian Flight Services
AMO	Approved Maintenance Organization
AOC	Air Operators Certificate
ATO	Approved Training Organization
CAA	Civil Aviation Authority
ECAA	Ethiopian Civil Aviation Authority
ECARAS	Ethiopian Civil Aviation Rules and Standards
EAE	Ethiopian Airports Enterprise
EAG	Ethiopian Airlines Group
EAL	Ethiopian Airlines
EASA	European Union Aviation Safety Agency
EFNMS	European Federation of National Maintenance Society
FAA	Federal Aviation Administration
GA	General Aviation
IATA	International Air Transport Association
IFR	Instrument Flight Rule
ICAO	International Civil Aviation Authority
ISA	International Standard Atmosphere
KCAA	Kenyan Civil Aviation Authority
MRO	Maintenance, Repair, Overhaul

MTOW	Maximum Take-off Weight
NBAA	National Business Aviation Association
OEM	Original Equipment Manufacturers
PWC	Pratt-and-Whitney Canada
PDP	Pre-Delivery Payment
SPSS	Statistical Package for Social Science
SSCAA	South African Civil Aviation Authority
VFR	Visual Flight Rule

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Abstract

Despite the various challenges and dynamism in the sector, airlines still continue to acquire aircrafts to support their operational requirements to meet the flying needs of their customers. They also expand their operation and earn improved profits. However, they also face grave danger of bankruptcy if they make the wrong acquisitions. The main purpose of this research paper was to assess the practice and challenges of aircraft acquisition projects in the case of Ethiopian Aviation Sector. The study targeted a total population of 501 management and senior level employees of air operators in Ethiopian Airlines and the aviation arena. Hence, 222 samples were systematically taken. From the total 222 samples, 180 responses were found valid for analysis. Mixed research approach with concurrent triangulation strategy was adopted. The study used mostly primary data sources and also secondary data sources as required. The Primary data collection instruments were questionnaires, interview and personal experience as aviation professional while secondary data were obtained from policy documents, journals and newspapers. Statistical Package for Social Science (SPSS) v20.0 and Microsoft Excel 2010 was utilized to analyze and present the data through table and graph. Descriptive Statistics (frequency and percentage) as well as Mean and Standard Deviation were adopted to showcase and explain the results. The results of the study showed that air operators in Ethiopia face multi-dimensional challenges in their attempt to acquire aircraft among which are aircraft financing, restrictions imposed by the government and regulatory body, lack of adequate financial and legal consultations, as well as lack of skilled human power. The results also indicate that air operators embark on aircraft acquisition solely driven by operational and environmental requirements without meticulously analyzing other aspects such as financial, legal and regulatory requirements. It can be concluded that the sector's challenges are both internal and external and need solutions from within and outside the sector. It is recommendable that the government grants the sector the deserved attention, ease up some financial and regulatory restrictions, liberalize and allow foreign investors to take part in the sector, as well as, for financial and legal firms to expose themselves to the sector. Air operators are also recommended to take the necessary measures to assure that right acquisition are carried out taking different factors such as financial, legal, operational, environmental, regulatory (national and international requirements), professional requirements and technical specifications into consideration.

Keywords: *Aircraft Acquisition, Aviation industry, Ethiopian Aviation Sector, Aircraft financing, Air Operators, Flight Services, Aircraft, Airlines.*

CHAPTER ONE

INTRODUCTION

The first chapter of this study provides background information regarding the history of aviation in Ethiopia, and the subject aircraft acquisition. It also entertains the study's statement of problem, objectives, research questions, scope, and limitation of the study, significance, and organization of the paper.

1.1. Background of the Study

History of aviation in Ethiopia goes back to 1929 when French made airplane, Potez 25 flown by a French pilot Andre Millet landed in the western side of Addis Ababa enrooted from Djibouti. This was 26 years after the first attempted flight by the Wright brothers and two years after the famous flight across the Atlantic by Captain Lind burg. Although Millet piloted the first aircraft which marked the history of aviation in Ethiopia, soon came with his successors with other types of airplane after one month time- in the month of September (The History of Aviation in Ethiopia, 2017). Prof. Richard Pankhurst writes that even though airplanes took a long time to arrive here in Ethiopia, a monoplane assembled in the country named "Tsehai" after Emperor Haile Selassie's daughter's name was one of the first plane assembled in Africa in 1935 (A Short History of Aircraft in Ethiopia, 2012).

Ethiopia is now known for its signature airline (Ethiopian Airline).It was established on December 21, 1945.As a flag carrier of Ethiopia, the airline has become one of the continent's leading carriers, unrivalled in Africa for efficiency and operational success, turning profits for most years of its existence (IATA, 2017).Ethiopian has just announced its 125thworldwide destination. As one of the pioneer African airlines, Ethiopian began operations, with DC-3/C-47 aircraft. According to TewoldeGebremariam, (CEO-Ethiopian Airlines Group),it has now become one of Ethiopia's major industries and an institution in Africa with the net profit of \$ 233 million in 2017/18 fiscal year (Reuters, 2018). It commands the lion's share of the Pan African network, including the only daily east-west flight across the continent (Star Alliance, 2019).However, although Ethiopia is among the pioneers in African sky and its flag carrier is known for its success, same cannot be said regarding the development of the aviation sector in

the nation. This is evidenced when we compare the number of operators nationwide, in contrast to that of other African nations like Kenya which joined the aviation industry in 1977 - 32 years later from Ethiopia. There are not more than ten private air operators registered in the general aviation sector and one big airline owned by the people and government of Ethiopia making Ethiopia's aviation sector comparatively poor to that of other African nations like Kenya and South Africa which have more than 48 and 22 registered air operators, respectively (KCAA, 2019; SSCAA, 2019).

Col. Wosenyeleh Hunegnaw (Director ECAA) argues that "...the government has allowed private airline operators to import aircraft from abroad through a purchase-lease modality. Moreover, they are entitled to duty free spare parts and related utilities for their service. Private aviation ownership is open to Ethiopian nationals only. In general, the incentives are encouraging to welcome private aviation operators...." (The Ethiopian Herald, 2017). Despite him stating these facts, only few private operators are thriving in the industry of Aviation in Ethiopia. Aircraft are complex, sensitive machines. According to Robert Drover (a Director Sales and marketing at Lufthansa Bombardier Aviation Services), parameters such as age, equipment, configuration, type of operation, operational environment, importing country regulations, number of owners, damage history, enrolled support programs, remaining reserves, service and maintenance history, modification status and documentation quality all have an impact on an aircraft's quality and value within its market. (AvBuyer, 2018). Running an airline is unavoidably expensive. One of the most basic costs is the price of buying the airplanes themselves. For instance, a Boeing 737, a relatively small passenger jet, costs around \$50 million or more. Larger jets can approach \$300 million in price (Boeing, 2019).

Therefore, this study is set forth to assess the practices and challenges of new aircraft acquisition projects in Ethiopian aviation.

1.2. Statement of the problem

IMF estimates Ethiopia's population to reach 105 million which makes Ethiopia the second most populous nation in Africa after Nigeria, and the fastest growing economy in the region (IMF, 2018). However, it is also one of the poorest, with a per capita income of \$783 (World Bank, 2019). Ethiopia aims to reach lower-middle-income status by 2025 (GTP I & II). According to World Bank, Ethiopia's economy experienced strong, broad-based growth averaging 10.3% a year from 2006/07 to 2016/17, compared to a regional average of 5.4%. Ethiopia's real gross domestic product (GDP) growth decelerated to 7.7% in 2017/18. Industry, mainly construction, and services accounted for most of the growth and agriculture and manufacturing made lower contribution to growth in 2017/18 compared to the previous year. Private consumption and public investment explain demand-side growth, the latter assuming an increasingly important role.

Robert Drover (a Director Sales & marketing at Lufthansa Bombardier Aviation Services) stresses that aircraft acquisition is a complex and sensitive matter. He argues that we must not be blinded by a good ramp appearance and flashy interior. In the grand scheme of selecting and purchasing an aircraft the exterior and interior are secondary aspects which can easily be changed to meet the buyer's taste and expectation. The baseline green aircraft is what provides the safe, reliable and effective transportation when it's managed and maintained properly- and it's what can also blow your operating budget if poorly managed and operated (AvBuyer, 2018). A successful commercial airline operation depends on many parts of the system coming together to best serve the flying public. Introducing a new aircraft is in many ways associated with some risks in that, the airline industry is capital intensive and the accounting for aircraft assets has a significant impact on the financial results of airlines (IATA, Airline Disclosure Guide, 2016). Aircrafts are high-cost, long-life assets and contain many individual components. Orders for aircraft are often made several years in advance of delivery at prices that may include complex mechanisms for discounting the list price, including 'credits'. Payments to aircraft manufacturers may include payments for options (amounts paid in advance to secure an aircraft purchase), purchase rights, deposits and progress payments. These payments in advance of delivery can give rise to significant financing costs. In the aircraft industry, transactions are typically denominated in US Dollar and can therefore expose non-US airlines to currency risk (IATA, Airline Disclosure Guide, 2016).

Typically, there is an end customer who expects operations to start on-time and then continue with a reasonable, or even a specific service level and reliability. Airline's revenue is often linked to the service level, and the flying hour production and dispatch reliability is therefore the main focus of the planning and execution of such a project.

Obviously, the aircraft acquisition cost is a major factor in any aviation business venture. ADG. (2016). However, this part is known early on in a project and is therefore not high on the risk list.

According to (Air Contact Services, 2019), the continued support of a new aircraft type, both in terms of cost and performance is unknown and a risk. The outcome is highly dependent on support programs, spare part availability, and the ability of the support organization to preplan scheduled events and efficiently address unscheduled events. Thus, the key to success lies in proper management of change, good systems, early preparation of the support organization, and, a plan for knowledge transfer (ACS, 2019).

TewoldeGebremariam (CEO-EAG) said an airline business is one of the most difficult businesses to run in the world. Airlines are surrounded by monopolistic suppliers, but at the demand end of the value chain. They are dominated by almost perfect competitions driven by excess capacity in the market. "It is a paradox manifested by exponentially rising costs to produce the product," he said, "but continuously declining price of air travel to the customer" (AIN – Online, 2017). GTP II states that, the on-going programs will be strengthened (with human power and technology) to enable services providing and regulatory institutions in the aviation sector fulfill the International Aviation Industry's standards and required competitiveness. With the aim of managing the sector efficiently, clear vision, policy and programs will be formulated for airports development and administration (GTP II, 2016). The GTP II further targets to increase number of passengers seats per billion Km flight distance from 32 in 2014/15 to 68 by 2019/20 and, also increase number of international flight destinations from 90 in 2014/15 to 127 by 2019/20 (GTP II, 2016). This, obviously among other activities, will be attained by acquiring more aircraft that best serve the flying people.

As such, aviation being capital intensive, any wrong acquisition of an aircraft in a 3rd world country like Ethiopia would have a greater and long lasting impact on the economy. Furthermore, (Kadletz, 1996) argues that aviation is both indispensable for modern economies

and not a matter that can reasonably be approached by isolated national legislation. Aviation by its nature at very least is an international matter. That is why the Ethiopian context needs to be examined against that of the international industry practices.

With that in mind, this study is set out to assess the practices and challenges of new aircraft acquisition projects in the aviation sector of Ethiopia.

1.3. Study Questions

The study attempts to answer the following questions:

- How do new aircraft acquisition projects take place in Ethiopia?
- What are the challenges of acquiring new aircraft in Ethiopia?
- What possible lessons can be drawn out?

1.4. Objectives of the Study

1.4.1. General Objective

The general objective of this study is to assess the practice and challenges of new aircraft acquisition projects in Ethiopia.

1.4.2. Specific Objectives

The following are the specific objectives of this study.

- To identify the new aircraft acquisition practices in Ethiopia;
- To examine the Ethiopian context against that of the international practice.
- To find out the challenges Ethiopian aviation industry faces while acquiring new aircrafts.
- To draw lessons and;
- To give suggestions on the areas of improvement.

1.5. Definition of Terms

1.5.1. Conceptual definitions

Aircraft: Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface (ECAA, ECARAS, 2013).

Civil Aviation: one of two major categories of flying, representing all non-military aviation, both private and commercial(Wikipedia, 2017).

General Aviation:is the term for all civil aviation operations other than scheduled air services and non-scheduled air transport operations for remuneration or hire. General aviation flights range from gliders and powered parachutes to corporate business jet flights (FAA, 2016).

International Standard Atmosphere (ISA):is a model used for the standardization of aircraft instruments(Universal weather, 2019).

Light Aircraft: is an **aircraft** that has a maximum gross takeoff weight of 12,500 lb (5,670 kg) or less(ICAO, 2017).

Operators: a company that provides air transport services for traveling passengers and freight by utilizing airplanes (FAA, 2016).

Regulatory: (also **regulatory authority, regulatory body** or regulator) is a public authority or government agency responsible for exercising autonomous authority over some area of human activity in a regulatory or supervisory capacity (ICAO, 2017).

1.6. Significance of the Study

The study could have the following significance.

Theoretical Significance

This study could contribute in academics for the simple fact that there are not many research works in relation to the aviation industry in Ethiopia. It lays the ground for further study in the area of similar projects undertaken in the sector. The few studies conducted in the sector were in service delivery, profitability and economic viability and quality management making this study among the pioneers in aircraft acquisition for Ethiopia.

Practical Significance

Based on the findings of the investigation, policy makers, regulatory bodies, facilitators and operators may strive to take appropriate measures to improve practices of aircraft acquisition projects. It can be used as a reference for understanding practices of aircraft acquisition projects. Furthermore, it can also shade light for further investigation in the area of similar projects undertaken by the sector.

1.7. Scope of the Study

Nationwide, there are not more than nine private airline operators and a national carrier. Hence, the study is limited to the assessment of practices and challenges of aircraft acquisition projects in those operators. The study is confined to civil aviation (**PROCLAMATION NO. 616/2008**) and does not seek to explore the experiences in the military aviation.

1.8. Limitation of the Study

This study is conducted by taking sample population of size 222 senior and management employees who are currently working in different (private and government) air operators and restricted to one commercial bank and legal advisor/consultant. All of these three divisions are under commercial division. It would be worth to include recognized contributors who took part in drafting the Civil Aviation Proclamation' (**PROCLAMATION NO. 616/2008**) for their opinions. Plus, all employees at all levels can be part of further research as the researcher believes there could be elements that are overseen by seniors and management employees. More

importantly, the researcher believes that additional research can incorporate other variables (if any) as there were no adequate written resources and literature in the sector written in Ethiopian context.

1.9. Organization of the Paper

This research document is structured in five chapters. The first chapter presents the background, statement of the problem, objectives, significance, delimitation and limitation of the study. The second chapter will be devoted to different literature reviews. Description of the study area, research strategy, data type and source, target population and sampling and sampling design, data collection method and data processing and analysis will be entertained in chapter three. The fourth chapter will make its focus on results and discussion of the study, while the last chapter will address summary of findings, conclusion, and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1. Theoretical Literature

Aircraft is the paragon of a movable device, built to overcome large distances within the shortest time and able to pass over every type of landscape and topography. Aviation is both indispensable for modern economies and not a matter that can reasonably be approached by isolated national legislation. Aviation by its nature is a supranational, but at the least an international matter.

2.1.1. International and National Regulatory Requirements

Ethiopia, through ‘proclamation for civil aviation’ (PROCLAMATION NO 616/2008) stated the desire to consolidate and modernize the aviation laws to bring the sector to international standards with a view to strengthening the regulatory, administrative, technical and supervisory capabilities of the Ethiopian Civil Aviation Authority (ECAA) for better regulation of civil aviation to meet the needs for a safe, secure, regular, efficient and economic civil aviation system (Federal NegaritGazeta, p1, 2009). The proclamation further outlines the need for aviation safety and regulation must be undertaken in compliance with the standards and recommended practices of the International Civil Aviation Organization (ICAO) and it is necessary to provide for the promotion and continuous development of civil aviation regulation and for other purposes incidental (p1).

Standardized Regulations – (The Chicago Convention, 1944)

December 1944 marked the global nature of aviation in Chicago with the convention on International civil aviation. The intention was to “.... require every contracting state to keep its regulations uniform, to the greatest extent possible, with those established under the Convention” (Chapter II, Article 12, p6). This convention entered into force after three years on 4th of April 1947. Ethiopia was among the 193 contracting states of ICAO after ratification was sent on 1st of March 1947 and signatory of different International conventions hence, the state is legally bound by the provisions of those treaties.

Article 37 of the Convention attempts to achieve uniformity in air navigation, by requiring that every contracting State cooperate in achieving "... the highest practicable degree of uniformity in regulations, standards, procedures, and organization in relation to aircraft personnel, airways and auxiliary services in all matters in which uniformity will facilitate and improve air navigation. To this end [ICAO] shall adopt and amend from time to time...international standards and recommended practices and procedures" addressing various aspects of air safety and navigation (Chapter VI, Article 37, p18).

Under Article 33, States are obliged to recognize the validity of the certificates of airworthiness and personnel licenses issued by the State in which the aircraft is registered, so long as the standards under which such certificates or licenses were rendered are at least as stringent as those established under the Chicago Convention. The negative implications of Article 33 are that if a State fails to comply "with the minimum standards which may be established from time to time pursuant to this Convention", then other States are not obliged to recognize the validity of the Certificates of Airworthiness issued by the delinquent State, and may therefore ban such aircraft from their skies, even when they have conferred traffic rights to the state pursuant to Article 6 of the Convention.

Environmental Issues – (The Kyoto Protocol, 1997)

Adopted in 1997, the Kyoto Protocol to the United Nations Framework Convention on Climate Change promises to move the international community closer to achieving the Convention's ultimate objective of preventing "dangerous anthropogenic [man-made] interference with the climate system". Ethiopia is also among the signatories since April 2005 meaning that the state is legally bound by the provisions of the treaty. Countries commit themselves to reducing their collective emissions of six key greenhouse gases (Carbon dioxide (CO₂), Methane (CH₄), Nitrous oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulphur hexafluoride (SF₆)) by at least 5% compared to 1990 levels, of which CO₂ is most relevant to aviation. In particular, an international "emissions trading" regime will be established allowing industrialized countries to buy and sell emissions credits amongst themselves.

Ethiopian Civil Aviation Rules and Standards (ECARAS)

Parts IV of the (ECARAS, 2013) talks about ‘Aircraft Registration and Marking’, it “...prescribes the requirements for registration and marking of civil aircraft under the provisions of the proclamation” (p6).The regulation consists of aircraft registration requirements, eligibility requirements, the application for registration, change of ownership, deregistration, nationality and marking of aircraft. It is clearly indicated under the ‘4.2. Registration requirements’ that:

- (a) “No person may operate a civil aircraft unless it has been registered by its owner or operator under the provisions of the laws of Ethiopia and the authority has issued a certificate of registration for that aircraft which shall be carried aboard or all operations.....”
- (b) “The certificate of aircraft registration shall be in English...” and that,
- (c) “Certificate of aircraft registration will be issued by the Authority” (p7)

Additionally, there are other rigorous requirements that must be met such as (p8):

Aircraft’seligibility for registration:-

(1) Owned or operated by:

(i) Ethiopian National,

(ii) An individual citizen of another State who is lawfully admitted for permanent residence in Ethiopia,

(iii) A government entity, Public enterprises and Developmental Associations of Ethiopia for own use only; and

(2) Not registered under the laws of any other state in case of newly manufactured aircraft or certificate of deregistration when the aircraft has prior registration in other state.

(3) The aircraft holds an acceptance type certificate issued in accordance with part 5...

(4) Not more than 22 years of age since manufactured and engaged in passengers transport.

(5) Not more than 25 years of age since manufactured and engaged in Cargo transport or an Arial work.

Thus, it is paramount these and other regulatory requirement stated under the ECARAS must be adhered for an aircraft to be successfully acquired.

2.1.2. Operational and Environmental Requirements

Operational Requirements are capabilities, performance measurement (measures of effectiveness, Performance and suitability) and processes needed to address mission area deficiencies, evolving threats, emerging technologies, or cost improvements(Manning,2010). (Stinton, D., 1998) every aircraft has a certain operational environment, including aspects of flight and ground operations that it is designed to serve in throughout its lifetime. For example the operational requirements of a fighter jet are much more strenuous than those of a commercial airliner. The flight regime is broadly defined by the range of different flight speeds and altitudes called the flight envelope. Within this range lies the so-called design point, which is the operational environment in which the aircraft is expected to spend most of its time in (The Anatomy of Airplane, 1998).(Manning, 2010), stresses that the assessment of operational requirements starts with the Concept of Operations (CONOPS) and goes to a greater level of detail in identifying mission performance assumptions and constraints and current deficiencies of or enhancements needed for operations and mission success.

According to (Stinton, D., 1998), the operating environment influences the overall shape of the aircraft which can broadly be broken down into three design segments: aerodynamic shape of wings, fuselage and controlling surfaces; the choice of propulsion; and the structural layout. Naturally, for a given design point and payload there will be conflicting requirements and optimal solutions for each area individually. Hence... the optimal compromise must be found(The Anatomy of Airplane, 1998).

Periodically, it is necessary for an airline to acquire new aircraft in order to expand their business or to replace older units which may no longer be safe or economically viable to operate. According to (Bombardier, 2014), approximately 50% of new business jet demand comes from existing owners replacing their aircraft, typically 5-10 years after initial delivery.... Therefore,the decision making process for determining what type and what quantity of aircraft to obtain and which manufacturer to purchase them from is often complex. Each different aircraft type has its own capabilities and characteristics which may or may not make it suitable for a given airline or route(Miller,2006, p9).

2.1.3. Technical Specifications and Performance

A new aircraft will likely be in service for 20 or more years and the purchase price for aircraft and the operating expenses associated with them are very high (Miller, 2006, p9). Too many variables are put into consideration for an aircraft to be deemed 'OK' for acquisition relating to their technical specification and performance. However, (Conklin & Decker, 2019) outlines that among others the following three are main questions most prospective buyers have about an aircraft,(Jet Support Services Inc., 2019):

- A. How big is the cabin? (Size and Dimensions),
- B. How fast does it fly? (Speed), and
- C. How far does it fly? (Performance Range).

A. How big is the cabin? (Cabin Size and Dimensions): This includes parameters such as:

- Cabin height, width, and length
- Cabin volume
- Cabin door height and Width
- Baggage Volume
 - Internal baggage volume
 - External baggage volume
- Crew Seats/executive seatsetc...

B. How fast does it fly? (Speed): This includes parameters such as:

- **CruiseSpeed**
 - Minimum Cruise Speed
 - Maximum Cruise Speed
 - Normal Cruise Speed
 - Long Range Speedetc...
- **Aircraft Weights**
 - Maximum Take-Off Weight/Maximum Landing Weight
 - Basic Operating Weight
 - Usable Fuel
 - Payload with full fuel
 - Maximum payload

- **Engine Type and Manufacturer**
 - The Number of Engine
 - Manufacturer of Engine
 - Model of the engine

C. How far does it fly? (Performance Range): This includes parameters such as:

- Range (4 Pax)
- Ferry Range
- VFR Range
- VFR Ferry Range
- Balanced Field Length (BFL)
- Landing Distance (Factored)
- Rate of Climb (Ft/min)

Next generation aircraft have more range and lower fuel consumption at comparable price points. This is due to continued technological improvements, notably in the development of new engines, new materials, and more advanced aerodynamics (Bombardier, 2014).

According to IATA, examples of the main typical components of an aircraft to look out include, but are not limited to: (Airline Disclosure Guide, 2016).

- Airframe
- Engines
- Modifications
- In-Flight Entertainment (IFE) and Buyer Furnished Equipment (BFE).
- Rotable assets – parts which are normally maintained and reused.
- Repairable – parts which are capable of being repaired and reused but which can only be repaired a limited number of times
- Embedded maintenance (engine overhaul)

2.1.4. Maintenance Repair Overhaul (MRO), Service Support and Certified Spare part Vendors

(Darli R., Paula Lavorato., 2016) defines MRO as "all actions that have the objective of retaining or restoring an item in or to a state in which it can perform its required function. The actions include the combination of all technical and corresponding administrative, managerial, and supervision actions" (EFNMS, 2013). (Kinnisson, 2012)states that maintenance can be described as the process of ensuring that a system continually performs its intended functions at its original level of reliability and safety. (Viles et al., 2007) emphasizes the goal of maintenance is not only to reduce repair time but also to improve product reliability, as well as to capture relevant information for analysis. "Maintaining complex systems such as aircraft fleets, rail systems, and production facilities can often exceed the cost of research, development, and production". (Randall, W. S., Pohlen, T. L. and Hanna J. B., 2010)(Safaei, N., Banjevic, D. and Jardine, A., 2011) states "...the aircraft fleet maintenance plays the most important role to guarantee the safety and reliability of the fleet in commercial airlines and military air forces". "The importance of MRO can be judged by the fact that it typically constitutes 12-15 % of an airline's operating cost (IATA, 2009),(McFadden.,Worrells, 2012) states that the worldwide MROs have grown in response to continuous and increasing demand into a viable segment of the aviation industry. (CIMData.,2002) highlights that the profitability of the industry is not from the sale of aircraft, but frommaintenance for an anticipated thirty-plus year lifespan.

Regarding in-house airline maintenance capabilities, (Carpenter and Henderson, 2008) explain that commercial airlines can establish MRO services in their own fleets and operate as profit centers; however, it is not uncommon for airline operators to spin-off these MROs and act as a separate, corporate activity. "Third Party Independents perform similar functions as In-house MROs but are not affiliated to an airline operator. Independents often provide these services at a lower price. Therefore, independents market themselves as the value proposition over the OEMs and In-house MROs". Analyzing the operation side,(Kinnisson.,2012) explains that aircraft maintenance can be divided into scheduled and unscheduled maintenance. Scheduled maintenance is a preventive action to ensure that a product functions properly at pre-set intervals. Unscheduled maintenance is not planned or programmed, but it is required when an item has

failed or broken down. Hence, it is both unavoidable therefore, operators must critically think about MRO facilities before acquiring an aircraft.

(Bombardier, 2014), the availability of more capable and efficient aircraft supports demand for replacement aircraft and attracts first-time buyers to enter the market. Thus, new aircraft programs are an important driver for business jet market growth. Integral to the decision making process is the ability of the manufacturer to meet the time requirements of the customer airline. Aircraft production is limited to a specific rate, such as 100 per year for a given model, and each aircraft has a delivery position or delivery date when it will be delivered to the customer. These delivery positions are referred to as "slots" (Miller, 2006, p10).

Paul Jebely (a writer at Clyde & Co) says commercial aircraft production takes a relatively long time, from several months to several years, even in relation to long-running production programs like the Boeing 737. As to why this is the case, it may be helpful to take the Boeing 737 family as an example and consider that there are approximately 600,000 parts to be manufactured and installed on such an aircraft. The production process requires large expenditures of working capital by the OEMs, (such as Boeing, Airbus, Bombardier and Embraer) on account of facilities, materials, labor and sub-contracts (Clyde & Co., 2015).

The production rate for the manufacturer assembly line may potentially be increased to meet higher demand but this increase may be difficult to implement on short notice. Many different suppliers contribute components to the aircraft manufacturers and the final assembly line may only increase its rate if all the suppliers are able to meet the new production quota. Since this limited production volume must be shared by all customers purchasing that model of aircraft from a given manufacturer, it is not always possible for the customer to specify exactly when they would like to receive their aircraft. Because of the manufacturing time as well as crew training and other factors, most large orders (10 or more units) are delivered over a period of several years (Miller, 2006, p10).

2.2. Empirical Review

According to ICAO, (Air Transport Reports, 2017), the global revenue traffic for international scheduled services alone, 2008 – 2017 shows an increasing trend reaching 1,660 million for passengers number, 4,860,927 million for distance in kilometers (passenger-km), 37.0 million for freight tons, 194,349 million for distance in kilometers (Freight- tone km), 5,489 million for mail tone-km and, 657,836 million for (Revenue-tone km) these figures show a global increase of 7.9 % , 8.4%, 9.8 % , 10.4%, 12.0%, and, 9.2% respectively in contrast to the figures in the year 2016 for the international scheduled service category alone (p2). The report further lists the regional distribution of scheduled traffic for international and domestic services, as well as, countries and groups of countries whose airlines performed more than 100 million total tonne-kilometers in the year 2017(p4). Ethiopia with its global share of service had 5,572 million for passengers (international and domestic), 5,057 million for (international alone) generating a revenue of 34,903 million (international) and 34,234 (international alone) in passenger-kilometers which ranked 1st for Africa and 30th, 25th, 32nd and 31st for respective categories globally (p6). From this, we can conclude that the global revenue traffic for international and domestic services are showing a steady growth of service needs with huge potential in the industry which should alert commercial airlines to expand their operation for their ‘share of the pie’ from the global market.

2.2.1. Aircraft Financing

Tom Woods (Head of Aviation Finance and Leasing in KPMG Ireland), says “the aviation industry has been thoroughly enjoying an extended bull run for the past decade. Airlines have had access to cheap finance as tough competition pushed down lease rates and debt costs. Lessors, while grappling with a very competitive marketplace with many new entrants, have also been capitalizing on the availability of cheap finance and the demand for additional lift as passenger numbers continue to grow. Banks too are busy funding deliveries, and despite depressed margins and fierce competition, continue to find innovative ways to add value” (The Aviation Industry Leaders Report, 2019). Shamshad Ali (partner at PWC) states that “aviation financing is a hot topic and likely to remain so over the coming years, as the demand for financing deliveries of new aircraft peaks at a time when long term financing becomes unattractive for some of the incumbent banks” (Aviation Finance, 2013). Martin S. Ormon (analyst

at Aircraft Finance Corporation) states, “the “Big Banks” altered the way in which loans are made on aircraft transactions after the financial crises of 2008. With significantly shorter terms and stricter aircraft age requirement, they are no longer offering clients what is considered to be, “good deals”. These banks typically offer 5 – to – 7 year terms on pre-owned aircraft and require that the aircraft is no older than 7 to 10 years in age” (AvBuyer, 2018). However, while limited by the assumptions included in them, airlines often provide the justification for purchasing new aircraft. An aircraft may cost as much as \$200 million(Miller, 2006, p9).Financing may be necessary to produce enough capital to purchase the aircraft and negotiations with creditors can add to the complex economic evaluation process.Neil Hampson (partner at PWC) states that “...the industry has seen record aircraft orders driven by the operational needs of airlines. Finding funds for these orders will be a challenge”(Aviation Finance, 2013). Boeing declares that lessors will continue to play a vital role in supporting new airplane deliveries, while sourcing a greater share of their portfolios from direct order books (Boeing, 2019). This could indicate that commercial airliners are still dependent on lessors’ finance to acquire new aircraft.

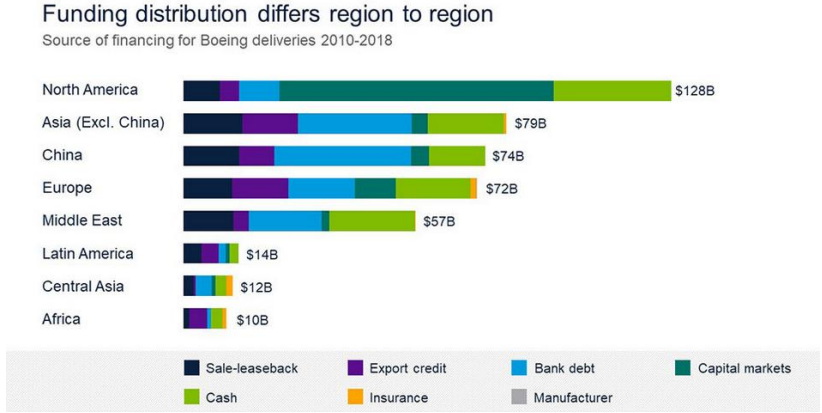


Figure 1 – Sources of financing for Boeing deliveries (2010-2018)
 Source: (Boeing, 2019)

It also announces that the expansion of global participation in aircraft financing, increased capacity for pre-delivery payment and debt financing, and the continued maturity of the global aircraft financing legal framework; these trends were expected to continue in 2019. Meaning there exists a great interest from the global financiers to help commercial airliners acquire new aircraft.

Strong aircraft financing environment



Figure 2-Aircraft Financing Environment 2009-2019F

Source: (Boeing, 2019)

The disclosures made by airlines in their Annual Reports provide insight into the relevant accounting judgments made including the determination of acquisition cost and the identification of individual components, their useful economic lives and their residual values. Generally, all costs incurred in bringing aircraft into working condition should be capitalized. (IATA, Aircraft Disclosure Guide, 2019). This will include the purchase price paid for the aircraft, any related costs to making the acquisition and any adjustments to these costs or prices made as part of the purchase agreement (ADG, 2019).

a. The purchase price

This is actually the price of the aircraft typically the manufacturer's list price is not the price that is negotiated and paid for the aircraft and the purchase will include a number of other elements. There are a wide range of fleet acquisition terms existing across the airline industry and as a result a detailed assessment of the specific purchase agreement will be required in order to determine the final cost to be capitalized (ADG, 2019).

1) Costs related to the purchase

Additional costs that can be capitalized can include **payments for purchase rights** or **purchase options**. These are distinct from manufacturer credits, and include amounts paid to secure the right to buy a certain aircraft at a certain time (ADG, 2019). According to Paul Jebely (a writer at Clyde & Co) Pre-Delivery Payments are payable on the signing of the purchase agreement and on other dates in the run up to the scheduled delivery date of the aircraft in what is typically

known as a “hard landing” (increasing) or a “soft landing” (decreasing) payment profile. These payments typically range between 15% and 30% of the total aircraft list/base/gross purchasing price— i.e.: the price before discounts, credits, etc.... which always serves in effect to reduce the aircraft’s list/base/gross price to varying degrees. PDPs represent a significant commitment and outlay of cash by the airline or lessor customer, especially in the case of multiple aircraft orders which, depending on the aircraft type(s) in question, can easily reach into billions of dollars. These payments function to decrease liquidity for months (or years) without increasing revenue, and so PDP financing is often sought to help maintain accounting liquidity (Clyde & Co., 2015).

(i) Option Payments and Refundable Deposits

Airlines frequently acquire options to purchase aircraft in the future, the commercial rationale being to keep aircraft acquisition capacity as flexible as possible as well as establishing a position in the manufacturer's production queue (ADG, 2019).

(ii) Manufacturer’s Credits

It is common for airlines to receive credits from aircraft or engine manufacturers to incentivize the purchase. These credits come in various forms including guaranteed trade-in values, spare parts support, marketing support, training support or introduction costs support (ADG, 2019).

b. Operating Cost

Operating cost are expenses that are directly related to the operation of the aircraft.

(i) Variable costs are expenses that are changing in proportion to aircraft usage.

Included are *fuel expense, maintenance labor expense, crew costs, parts expense* and *miscellaneous trip expense*. (AOCG, 2007).

(ii) Fixed costs (Annual) these expenses show little or no change in proportion to changes in activity. Area of expense includes those costs that must be borne by a flight department irrespective of the level of aircraft utilization. Included are *Hull and Liability Insurance, depreciation, rental charges, maintenance software programs* and *miscellaneous services* (AOCG, 2007).

(iii) **Training Costs** are aircraft-specific *training expenses for pilots, cabin crew and maintenance technicians*.(AOCCG, 2007).

(iv) **Periodic Costs:** This area of expense refers to costs for engine *Hot-Section Inspection, Engine Overhaul, Airframe Stripping/Repainting, Interior Refurbishment* and a *Modernization/ Modification/ Upgrade* allowance. (AOCCG, 2007).

2.2.2. Regional and Global Airline Market Conditions

Over the course of the next 20 years, the global commercial aircraft fleet is expected to double to approximately 45,000 aircraft, a growth particularly driven by increased air travel due to an expanding middle class in emerging economies. Meanwhile, new aircraft platforms and engines are emerging as a result of changing customer demand and the industry's relentless pursuit of cost reduction; an entry-into-service period which has been characterized by a series of teething issues (Satair, 2019).

IATA's Industry Affairs Committee (IAC), commissioned a study with the aim of anticipating the key risks and opportunities global commercial aviation will face between now and the year 2035. The Committee had three specific goals in mind when commissioning this study:

- To anticipate the opportunities and challenges the industry will face and take actions to address them today.
- To facilitate similar discussions at an airline and alliance level and,
- To partner with governments to lay the groundwork for sustainable air connectivity growth.

The general objective of the study was to “.....explore the forces shaping the future of aviation, and to look at the potential implications for the airline industry” (Future of the Airline Industry, p5, 2018). The study has identified too many ‘**key drivers of change**’ such as infectious diseases, alternative energy, political instability, global economy, terrorism, cyber security, environmental activism, tensions between data privacy and surveillance, etc ... and, has grouped them thematically in to **Geopolitics, Security and borders, Environment, Economy, Data, Privacy and Trust, Technology, Values and communities, Government,** and **Business Model**(p6). The study gave detailed recommendation on each thematically grouped

‘change drivers’ as to what must be done to control the effects and concluded that: “.....while the future is unpredictable, there are steps we can take to be better prepared for what it may bring. As an aviation community, armed with an analysis of future trends and acting with a common purpose you can take steps to influence how the future unfolds. And as a commercial player in the airline industry, you can add these insights to your strategic thinking to gain a competitive edge...”(IATA- Future of the Airline Industry, 2018).

According to (Boeing, 2019), the aviation industry has shown an exceptional level of resiliency in a dynamic environment, demonstrating the underlying strength and value of air travel. For the ninth straight year, passenger traffic recorded above-trend growth with historically high load factors and aircraft utilization rates. This consistent passenger growth, along with the continued health of the air cargo market, is allowing the industry to grow efficiently despite oil price headwinds and the rising commercial airlines use their fleets of aircraft to transport passengers and cargo around the world(Boeing, 2019). Per the (The Aviation Industry Leaders Report, 2019) Oil prices increased significantly in 2018 peaking at US\$86/bbl (Brent Crude) in October but fell to US\$55.63/ bbl in late December 2018. While the drop in the oil price during the fourth quarter of 2018 gave airlines a slight reprieve, it is likely that they will rise again. Citi, however, predicts that the average oil price will be \$60/bbl in 2019 but it could be driven higher for a variety of reasons.

The aircrafts are a significant and essential component of their business and great care is taken in matters related to these aircraft.

2.2.3. Skilled Manpower (Flight and Maintenance Crew Training)

Col. Wossenyeleh Hunegnaw (Director of ECAA) acknowledges that "...the aviation industry by nature is capital intensive and requires highly skilled human resource. However, the government has allowed private airline operators to import aircraft from abroad through purchase-lease modalities" (The Ethiopian Herald, 2017). Aviation is in a perpetual state of evolution and modernization; constant change is an inherent characteristic of the industry. Be it standards, regulation, or even equipment, there is very little that remains unchanged from one year to the next. There are several external factors, security being foremost, for which reliable control measures are predominantly short-lived. This reality raises an ever-present challenge: the skills and knowledge of yesteryear simply won't suffice for those looking to enter the sector or to grow within it (ICAO- Training Report, 2018).

According to Meshesha Belayneh (Deputy Director, Technical Cooperation Bureau and Chief, Global Aviation Training Office, ICAO), commercial air transport has expanded over the last ten years, new airline operators have entered the market. Today, the highest numbers of aircraft orders ever, are registered. Over the next 20 years, not only will these new aircraft need to be commanded by qualified pilots, maintained by skilled technicians, and managed by competent air traffic controllers, but the global air transportation system will need to be efficiently managed by new, up-to-date and technology-savvy managers (ICAO- Training Report, 2018). Captain Stefan (Head of Regulatory Affairs Crew Training, Lufthansa Group Airlines), explains operating civil air transport category aircraft in the world of today has not only changed with the introduction of new technology, it is the complexity of operation and infrastructure that also continued to increase to a new level. Meshesha stresses "Another important consideration for human resources development, management, and planning, is the rapid increase in the deployment of new technologies across every major industrial sector, particularly in aviation. This is leading to tremendous competition globally for qualified technical personnel and managers who are able to understand the complexity of this new environment..... There is an ongoing need for increased coordination as States establish the training and educational programs needs and course offerings that are required globally, regionally and locally" (ICAO - Training Report, 2018). Captain Solomon Gizaw (Founder and Managing Director of AFS), says the ECAA has been doing extraordinary professional job in advancing the nation's aviation industry though there is still knowledge gap that needs to be filled if the sector is to make

significant impacts—(The Ethiopian Herald, 2017). Stephen P., (Director, Air Navigation Bureau), ICAO, as the industry considers the modernization of flight crew training made possible by introducing Competency Based Training and Assessment (CBTA), the remaining vestiges of previous thinking need challenging to complete the transformation. ...training strategies and systems need to exploit evolving technologies, and our greater understanding of human interactions, to progress the various aspects of flight crew training to improve safety (Royal Aeronautical Society, 2019).

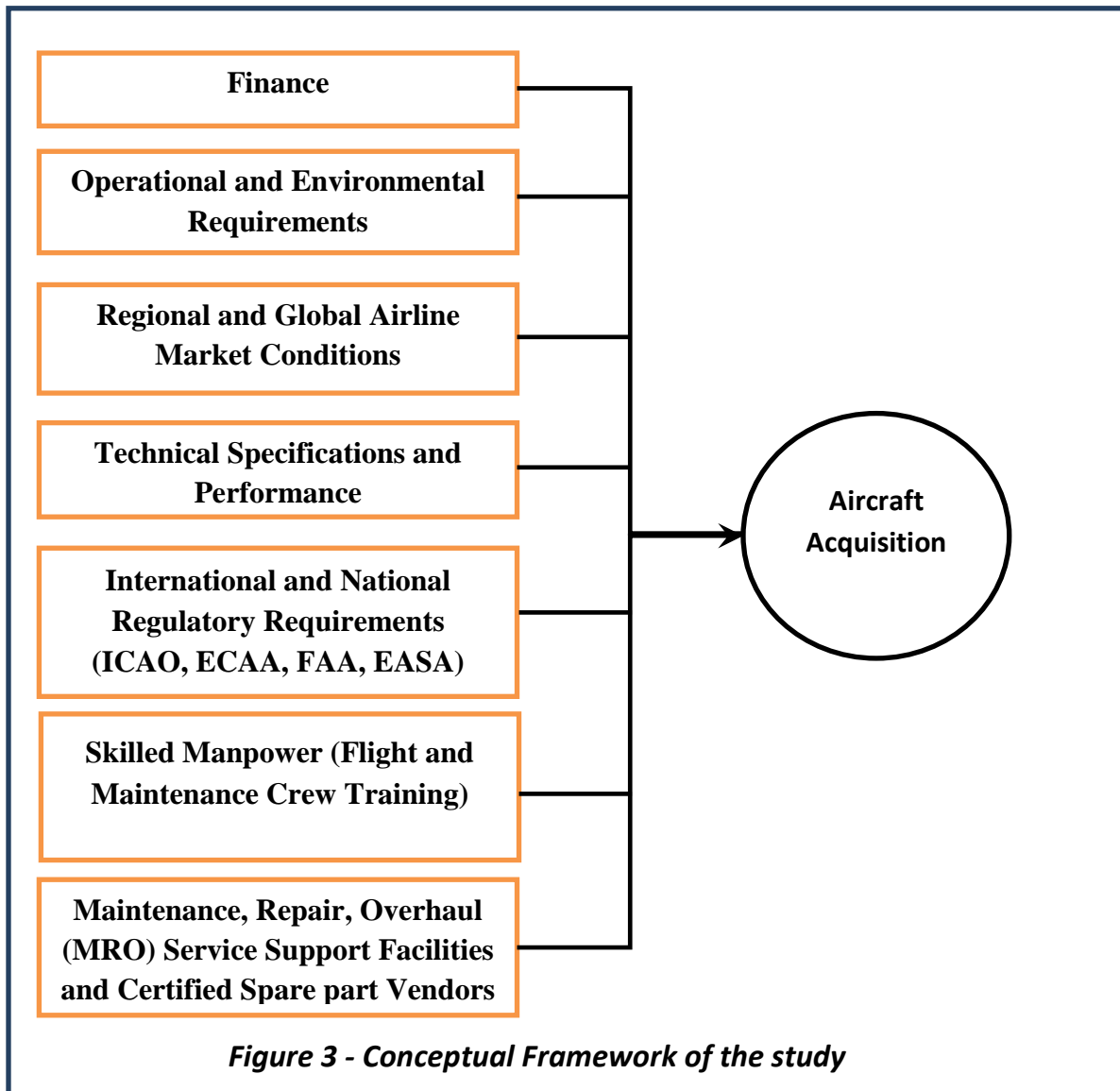
According to Craig F., (a Credit Rater at Fitch Ratings), "...labor costs are becoming a more significant threat to airlines, specifically because pilots and skilled technicians are in scarce supply and are backed by stronger unions. Maintenance costs are rising due to more expensive labor and rising interest rates, pushing up prices for airlines and aircraft owners. IATA is forecasting an average increase of 2.1% for unit labor costs in 2019, which will further squeeze airline profit margins over the next 12 months" (The Aviation Industry Leaders Report, 2019).

Ed Grabianowski (a writer at 'How stuff works'), referencing payscale.com, argues that: "...hiring qualified pilots to fly the planes is also a major cost. A pilot with 10 years of experience will earn upwards of \$100,000 in annual salary. First officers and other crew members make less, but still represent a major cost"—(How Budget Airlines Work, 2018).

Therefore, the aviation community must be adept and responsive to overcome these and other types of challenges with regard to supplying skilled personnel for the sector – the need for qualified crew (pilots, cabin crew and technicians) which arises from acquiring new aircraft should thus also be not undermined.

2.3. Conceptual Framework

After reviewing related theoretical & empirical literature, the global practices and several indicators, a conceptual framework is developed by identifying the important variables finance, operational and environmental requirements, regional and global airline market conditions, technical specifications and performance, international and national regulatory requirements, skilled crew, MRO, service supports and certified spare part vendors to guide the study for investigating the challenges and practices of aircraft acquisition in the case of Ethiopia.



Source: (Self, 2020)

CHAPTER THREE RESEARCH METHODOLOGY

3.1. Introduction

This chapter deals with the research methodology that was used to study the practices and challenges of aircraft acquisition in Ethiopian aviation sector. First, it discusses the study design and approach used. Then, it goes on to explain the population of the study, sampling and sampling techniques, sources of data, data collection procedures, methods of data analysis and statistical techniques used in reporting. Finally, this chapter concludes with the ethical considerations.

3.2. Study Design and Approaches

Research designs are plans and procedures for research that span the decision from broad assumptions to detailed methods of data collection and analysis (Creswell, 2003). According to Creswell, there are three types of research designs: Qualitative, Quantitative and mixed methods. The aim of this research is to investigate the practices and challenges of new aircraft acquisition projects in the case of Ethiopian aviation sector by collecting both qualitative and quantitative data to best describe existing phenomenon.

3.2.1. Quantitative Research Approach

Quantitative research approach is one in which the investigator primarily uses positivist claims for developing knowledge (Creswell 2003, p. 18). Merriam (1998, p. 9) also noted that quantitative research design is based on the philosophy of positivism, logic and empiricism. Quantitative research employs a review of the existing literature to deductively develop theories. Well designed and implemented quantitative research has the merit of being able to make generalizations. To enhance the generalization of findings, quantitative research methods follow, at least theoretically, standardized procedures in sample selection, instrument design, implementation and analysis. This standardization in turn increases the replicability of procedures and the reliability of findings. Notwithstanding the above advantage, quantitative research design has a number of limitations. The first limitation is that quantitative research is based on the assumption that research procedures, including instrument design, sample selection and implementation, can be standardized and would lead to reliable outcomes. In reality this may not be easy nor true for several reasons. Firstly, the research problem may require

exploration of new ideas, which may not be achieved by following structured procedures. Secondly, due to lack of information about or access to the population and for convenience, the sample selected may not be representative of the population under study. This would introduce a bias, which may compromise the reliability of findings. Another limitation of quantitative research approach is that it appears to lack flexibility in design which may be crucial when additional information revealed through data collection needs further exploration for knowledge. Pure quantitative research design appears also to lack interpretive and exploratory examination of a research problem.

3.2.2. Qualitative Research Approach:

Qualitative Approach, on another hand, is the one in which the investigator often makes knowledge claims based primarily on the multiple meanings of individual experiences, socially and historically constructed meanings, participation in issues, collaboration or change oriented with an intent of developing a theory or pattern (Creswell 2003). In contrast to quantitative research design, qualitative approach is rooted on the philosophy of phenomenology, symbolic interactions and is based on naturalistic, grounded, constructivist, interpretive and participatory perspectives (Merriam 1998; Creswell 2003). Qualitative research is not intended to test a predetermined theory or hypothesis; instead, it is exploratory in nature and through induction it builds theories or hypotheses. As a result, in qualitative research approach there are no hypotheses, which would guide the study, to be deduced through examination of the existing theoretical and empirical studies. Qualitative research design has its own strengths and weaknesses. The advantage of a qualitative research design is that it is flexible and emergent without being constrained by standardized procedures (Liamputtong and Ezzy 2005). This feature of qualitative research enables the investigator to explore and understand phenomena entirely in their natural environment and discover emerging theories. Notwithstanding the above advantage, qualitative research design has its own limitations. First, the lack of standardized rules in the research design and the emphasis on giving meanings and interpretations to events and things reduces the objectivity and replicability of the research process. This in turn compromises the reliability of findings. In this connection, quantitative researchers have argued that the interpretive nature of qualitative data makes it soft science lacking in reliability and validity (Liamputtong and Ezzy 2005). Secondly, the findings of qualitative research cannot be

statistically generalized for a broader population of interest for it is based on a small and unrepresentative number of investigated cases. As the above discussion shows, both quantitative and qualitative methods have limitations. The merits of a quantitative research design may be limitations for a qualitative design and vice versa. The limitations of these research approaches could be mitigated by adopting a combined strategy. In connection to this, Creswell (2003) noted that through a mixed methods approach, biases and weaknesses inherent in any single method could be reduced.

The mixed approach contains many ways of combining quantitative and qualitative approaches. However, in this study only one of the strategies is applied which is concurrent triangulation strategy. This strategy helped the researcher to employ separate quantitative and qualitative data to corroborate the results. It allowed counter-balancing the limitations of quantitative and qualitative results. Equal priority is given to both results and collection of quantitative and qualitative data were done concurrently. Creswell (2003) noted that this strategy is the most familiar of all the strategies and it takes shorter data collection time than other strategies. This logic of triangulation helps to generate validated and substantiated results (Creswell 2003). Therefore, in this study, quantitative and qualitative data were collected simultaneously and the results were integrated to cross-validate and supplement each other.

3.2.3. Mixed Methods Approach:

Mixed Approach which is believed to mitigate the biases of quantitative and qualitative approaches, is one in which a researcher tends to base knowledge claims on pragmatic ground employing strategies of inquiry that involve collecting both quantitative and qualitative data either concurrently or sequentially to best understand research problems (Creswell 2003). Adopting a mixed methods approach has a number of benefits. According to Greene et al. (1989) the first benefit is triangulation pertaining to a situation where researchers seek convergence, justification, correspondence of results from quantitative and qualitative methods to increase validity of constructs and inquiry results. Secondly, by mixing methods complementarily, researchers seek elaboration, enhancement, illustration, clarification of the results from one method with the results from the other method. Thirdly, by mixing methods with developmental intent, researchers seek to use the results from one method to help develop or inform the other

method. Fourthly, mixing methods with initiation intent seeks the discovery of paradox and contradiction, new interpretations, the recasting of questions or results from one method with questions or results from the other method. Finally, to increase the scope of inquiry mixed method with expansion intent seeks to extend the breadth and range of inquiry by using different methods for different inquiry components.

Qualitative and quantitative approaches should not be viewed as polar opposites or dichotomies; instead, they represent different ends on a continuum (Newman and Benz, 1998). A study tends to be more qualitative than quantitative or vice versa. Mixed methods research resides in the middle of this continuum because it incorporates elements of both qualitative and quantitative approaches (Creswell, 2003).

Due to the aforementioned reasons, this study employed a descriptive research design along with mixed approach. The descriptive research design was selected because it was useful to describe existing situations (Bryman, 2012). This method was used to obtain information relating to the current status of an issue or phenomenon to describe “what exists” within the conditions of the situation. The mixed approach enabled the researcher to complement data obtained through quantitative tool by qualitative data. The qualitative measurement has helped to interpret ideas which were gathered through interview and open-ended questions while the quantitative method helped to interpret ideas which were gathered through questionnaires.

In light of the research questions and the underlying philosophy of each research approach. In this study, the quantitative method was predominantly used. However, to have a better insight and gain a richer understanding about the research problem, the quantitative method is supplemented by the qualitative method of assessment. That is, to get the benefits of a mixed methods approach, as presented earlier, and to mitigate the bias in adopting only either quantitative or qualitative approach, this research combined both quantitative and qualitative research approaches.

3.3. Population and Sampling Techniques

The airline business requires skilled and experienced employees for better understanding of the nature of the industry and for better productivity (Abel, 2017). It was essential to target senior employees and management staff who served in the airline for at least five years and have direct involvement in aircraft acquisition. This is to make the research more feasible as the issue requires deeper understanding of technicalities to respond to some of the research question better. Therefore, the target population for this research was employees within ten airline operators which helped get a full picture of the study subject.

Table 1. Air operators and their number of employees

	Air Operators (AOC holders)	Total # of employees	# Employees with more than 5 Years of experience	# of Managerial Staffs	Percentage
No.	Scheduled - (International & Domestic)				
1.	Ethiopian Airlines	12,944	4,455	450	98.87%
No.	Unscheduled- (Air charter, Cargo, Medivac)				
1.	Abyssinian Flight Services P.L.C	101	66	11	0.24%
2.	East African Aviation P.L.C	14	7	5	0.11%
3.	Trans-nation Airways P.L.C	16	8	6	0.13%
4.	National Airways P.L.C	54	32	7	0.16%
5.	Zemen Flying Services P.L.C	12	8	5	0.11%
6.	Aquarius Aviation P.L.C	14	7	5	0.11%
7.	Walya Airways	14	8	4	0.09%
No.	Special Services, and Company operators)				
1.	Amibara General Aviation Services	10	6	4	0.09%
2.	Salini Construction S.P.A	12	6	4	0.09%
	Total	13,191	4,603	501	100%

Source – (Own Survey, 2020)

The total number of employees who served in the aviation sector for at least five years and above was 4,603 which is 34.9% of the total population (13,191 active and permanent employees).

3.3.1. Sample size

The population of target respondents were 501 senior and management employees from 10 commercial airline operators (see Table 1), and it consists of heads of MRO, Crew Training, Flight operations, Safety Managers, Quality Assurance managers, Finance managers, and Administration employees.

Yemane's simplified formula (A. S. Singh and M. B. Masuku, 2014) was used to determine sample size. This formula was used to calculate the sample sizes as shown below. A 95% confidence level and $P = .5$ are assumed.

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

Where, n is the sample size, N is the population size, and e is the level of precision. By applying this formula to the above statement; we get:

$$n = \frac{501}{[1 + 501(0.05)^2]}$$

$$n = 222.41$$

$$n \sim 222$$

3.4.Sources of Data

The study assessed the practices and challenges of new aircraft acquisition projects in Ethiopia by using both primary and secondary data.

3.4.1. Primary Data Source

A primary source provides direct or firsthand evidence about an event, object, person, or work of art. Primary sources can include historical and legal documents, eyewitness accounts, results of experiments, statistical data, pieces of creative writing, audio and video recordings, speeches, and art objects. Hence, data for this study were obtained from senior and managerial post holders in their respective organization. This was determined purposively by their involvement and decision making in aircraft acquisition process. In addition to the air operators, other key informants like post holders in ECAA, Commercial banks and legal advisors were also incorporated in the data collection process.

3.4.2. Secondary Data Source

For triangulation purpose, secondary data was collected from ECARAS (Ethiopian Civil Aviation Rules and Standards) technical documents, aviation magazines such as AvBuyer, Aviation International News, 'Selamta' Magazines as well as newspapers such as 'Ethiopian Herald', 'The Reporter' and other publications. Furthermore, articles originating from different aircraft manufacturers, ICAO and IATA guidelines, working papers, safety reports and advisory circulars by ECAA as well as other related policies such as Civil Aviation Proclamation' (PROCLAMATION NO. 616/2008), GTP-I and II, Annual reports by the National Bank of Ethiopia (NBE), International Monetary Fund (IMF) and Ethiopian Investment Commission and aircraft lease and purchase from air operators were among many others reviewed and analyzed as secondary sources of data.

3.5. Data Collection Instruments

Primary data were collected via self-administered structured questionnaire and the key informant's interview. To enrich the primary data, secondary data (articles, journal, policy documents, regulatory documents, regional and global aviation reports etc.) were also gathered and examined in line with the objective of the study.

3.5.1. Questionnaire

The questionnaire is one of the most commonly used data collection methods within the survey methodology and it is possible to generate results that are representative of the whole population at a lower cost than collecting the data for the whole population (Saunders, Lewis and Thornhill, 2016). A structured questionnaire with both close-ended and open-ended questions were developed coherent with the research objective. Different types of questions such as Likert scale, ranking and choice were included in the data collection instrument. Furthermore, questions intending to collect data about the profile of the respondents such as age, sex, experience, functional area/division were also included. The questionnaire was prepared in English language in line with the conceptual framework developed for this study. To foster the distribution, questionnaire and collection was administered by the researcher in person.

3.5.2. Semi-structured Interviews

To enrich the analysis, a semi-structured interview guide were designed to facilitate key informant interview so that qualitative data would be collected through key informant’s interview from ECAA, air operators, and other stakeholders such as bankers, insurance and law firms with foreign trade auxiliaries. These institutions were contacted for qualitative information regarding government, support services, policy framework, as well as country strategy and, to determine possible solutions of the aviation industry.

3.6.Procedures of Data Collection

Questionnaires were developed based on the literature review aligned with the research objectives. The distribution of questionnaires were made to employees who works in different departments listed below (Table 2) and the selected sample respondents in these departments were given ample time to respond to the questions during their free time. The researcher have utilized own experience to determine the number of questionnaires to be distributed to each department purposively. The questionnaires were distributed to the employees at headquarters of each operator in person with hardcopy. To increase generalizability of the sample to the whole population, the data collection was made carefully by identifying appropriate departments with senior staffs and more related departments to the subject of the study by taking the necessary time that is convenient for respondents.

List of departments considered for the questionnaire with their respective distribution were:

Table 2. Questionnaire Distribution with respect to Department/Functional Area

S/N	Departments/Functional Areas	Number of Questionnaires Administered.
1.	Flight Operations,	30
2.	Marketing/Commercial,	15
3.	Safety Management,	20
4.	Quality Management,	30
5.	Engineering (MRO (Maintenance Repair Overhaul)),	50
4.	Crew Training,	35
5.	Legal Services	15
6.	Administration and Finance	27
Total Questionnaires		222

Source: Researcher’s Compilation (2020)

Similarly, 9 key informants were contacted, 2 x from regulatory (ECAA), 5 x air operators and other stakeholders such as 1 x commercial banks and 1 x legal advisors for an interview to complement information obtained through questionnaire. The key informants were identified using purposive and convenience sampling techniques. Purposive sampling is selected because it is used to sample cases/participants in a strategic way (Bryman, 2012) so that those sampled are relevant to the research questions that are being posed. Informants' relevance was determined by their involvement, position held and their decision making in aircraft acquisition process. The interviewees consist of stakeholders from the "Director of Aircraft Registration & Airworthiness" in ECAA and an employee from loan section in "Bank of Abyssinia", an aviation lawyer from "Teshome Gebre-Mariam Bokan Legal Advisors". The interview that took place with one of the air operator and the aviation lawyer was via telephone.

3.7. Methods of Data Analysis

This study employed mixed (qualitative and quantitative) approaches and used interviews, and questionnaires, as a data collection instruments. The collected data were then prepared, reviewed, analyzed and presented using descriptive statistics. Finally, depending on the purpose of the study, the data was appropriately integrated using consolidation or merging, connecting and embedding to draw and reach to logically meaningful result.

3.7.1. Quantitative Data Analysis

The collected data using questionnaire was verified, and cleaned for inconsistencies, missing value and outliers. The data collected using questionnaire was cleaned, verified, coded and entered into a computer using SPSS v20 (Statistical Package for Social Science). Descriptive method frequency and percentage was adopted for analysis purpose and Microsoft Office Excel 2007 was also used to generate and data presented using tables, charts, and graphs.

3.7.2. Qualitative Data Analysis

The qualitative data collected through semi-structured interview were segregated into themes and sub themes to provide a framework for thematic analysis. After constructing an index of themes and sub-themes, qualitative data was analyzed and described in line with the findings of the primary source through quantitative data collection tool. Both techniques of data analysis enabled to triangulate data.

3.8. Pilot Testing

Four tests are usually used to determine the quality of social research: construct (content) validity, internal validity, external validity, and reliability (Yin, 1994). Construct or content validity corresponds to the extent to which the operational measure for a construct reflects the construct's observable effects (McCutcheon and Meredith, 1993). Yin (2009) emphasized the difficulties in dealing with this issue in case research. Mainly, because subjective judgments are used to collect the data and researchers fail to develop operational measures. Among the tactics to overcome these issues, establishing a clear chain of evidence is mentioned.

Furthermore, the questionnaire and interview checklists were pilot-tested with the aim of investigating whether crucial components of a main study is feasible or should some instrument require alteration. Hence, four professionals in the sector were made to participate which resulted in adjustments such as sequencing, shortening and categorizing of statements to alter the instrument basing on their feedback. The goal of the test was to see which group of study sample is capable to respond to the questions presented and understand whether or not the content of instrument used for this study is rationalized and reliable. Additionally, the instruments were given to the same pilot testing professionals within a period of two weeks and assessed for retest reliability.

Table 3 - Reliability Test on Piloted Questionnaires (Cronbach's Alpha)

S/N	Category	Cronbach's Alpha	N of Items
1.	Aircraft Financing	0.98	3
2.	Legal services and firms	0.59	2
3.	MRO, Service support centers and Certified Spare part vendors	0.87	3
4.	International and National regulatory aviation regulatory requirements	0.715	3
5.	Technical and Operational aircraft limitations		
	Size and Dimension	0.947	9
	Speed Variables	0.952	4
	Aircraft Weight	1.000	5
	Engine Type and Manufacturer	1.000	3
	Performance Range	0.950	6
6.	Crew (Flight and Ground) Trainings	0.840	2

Source: (Pilot Test Data, 2020)

3.9. Ethical Considerations

As the study was conducted utilizing human participants who are on an actual operation of the airline business, it was conducted with high care and proper investigation towards answering the basic research questions. The privacy of participants is kept unrevealed.

In conducting the study, the questionnaires and interview methods are drafted in a very clear and concise manner to prevent conflicts of information among respondents. Respondents were given ample time to respond to the questions to avoid errors and inaccuracies in their answers. They were also given a waiver regarding the confidentiality of their identity and the information that they did not wish to disclose i.e. to promote trust between the researcher and the respondents and to keep the ethical standard, respondents were assured their response will be treated with strict confidence. All the references used in this study were cited and credited to their respective authors. Every data captured was based on informed consent and voluntarily. Among the significant issues that were considered includes consent, confidentiality and data protection (Creswell, 2003). The analysis including the above data is kept confidential and is not communicated to unauthorized party. The researcher keeps the data anonymous and will employ zealous effort to maintain the accuracy of the responses.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. Introduction

In this chapter, important stages of the data analyses are elaborated. It presents the summary of the data collected such as demographic information of the respondents, findings of the study and discussion on the findings in line with the conceptual framework to address the specific objectives of the study. Descriptive statistics is used to discuss the findings of the study.

4.2. Findings of the Study

4.2.1. Questionnaire Response Rate

As stated under the population and sampling section, the study targeted a sample size of 222 respondents. A set of questionnaire was distributed to 222 respondents. However, only 187 questionnaires were completed and returned for analyses because some respondents were not easy to track due to their work nature that involves frequent traveling and few others were less willing to respond. After rejecting improperly filled out, incomplete questionnaires and the outliers, 180 questionnaires were presented for analysis. Although a response rate of 50% is normally acceptable for analyses and reporting (Duncan D., 2008). The response rate for this study was 81.08% that was valid to draw conclusions. For the key informant interviews administered, initially the expectations was to conduct interviews from operators totaling 9. However, only 6 were managed to be carried out (i.e. 3 x Air operators, 1 x ECAA, 1 x Legal firm, and 1 x a commercial Bank) due to the ongoing global pandemic (outbreak of COVID-19). All these put into considerations, all of the collected data were analyzed.

Table 4. Questionnaire Response Rate

	Expected	Questionnaires Administered	Questionnaires Filled out & Returned	Questionnaires Valid for Analysis	%
Respondents	222	222	187	180	81.08%

Source: Researcher's Compilation (2020)

4.2.2. Reliability Test Result

Reliability is the degree to which measures are free from error and, therefore, yield consistent results (Thanasegaran, 2009). According to the Institute for Digital Research & Education, Cronbach's alpha is a measure of internal consistency, that is, how closely related are a set of items as a group or is considered to be a measure of scale reliability (UCLA, 2019). In practice, Cronbach's alpha ranges from 0 to 1 with a value of at least 0.70 has been suggested to indicate adequate internal consistency (Tsang, S., Royse, C. F., & Terkawi, A. S., 2017). Moreover, the output has been interpreted using the rule of George and Mallery (2003) that means if the result is > 0.9 (Excellent), > 0.8 (Good), > 0.7 (Acceptable), > 0.6 (Questionable), > 0.5 (Poor) and < 0.5 (Unacceptable). Thus, the data was checked for measure of consistency (APPENDIX- IV) and established that the responses are acceptable as shown in the summarized table below (Table 3).

Table 5 - Reliability Test Result (Cronbach's Alpha)

S/N	Category	Cronbach's Alpha	N of Items
1.	Aircraft Financing	0.894	3
2.	Legal services and firms	0.748	2
3.	MRO, Service support centers and Certified Spare part vendors	0.892	3
4.	International and National regulatory aviation regulatory requirements	0.715	3
5.	Technical and Operational aircraft limitations		
	Size and Dimension	0.967	9
	Speed Variables	0.952	4
	Aircraft Weight	1.000	5
	Engine Type and Manufacturer	0.908	3
	Performance Range	0.941	6
6.	Crew (Flight and Ground) Trainings	0.734	2

Source: (Primary data, 2020)

4.2.3. Validity Test

The instruments were developed in line with the conceptual framework which is originated from the literature reviewed. After initially developing the questionnaire and interview checklists, the instruments were pilot-tested with four professionals in the sector. The feedback from the pilot testing was reviewed, and adjustments to the instrument were made. The major adjustments were to shorten and categorize the statements, and the overall appearance in formatting of the items. The items and the instrument were next reviewed for content validity by an expert in the field. Feedback from the expert resulted in additional adjustments to the instrument. As a result, the whole look and content of the instrument was streamlined. Finally, the instruments were given to the same (pilot testing) professionals with in a period of two weeks and assessed for retest reliability which was found valid.

4.2.4. Normality Test

A common rule of thumb test for normality is to get Skewness and Kurtosis within range of +2 to -2 when data is normally distributed (Hair et al). Thus normality analysis was carried out for each response. All responses were within +2 to -2 range (Ref. Appendix-V) .That means the data is normally distributed.

4.2.5. Characteristics of Respondents

Table 6– Characteristics of Respondents

VARIABLE	CATEGORY	FREQUENCY	PERCENTAGE
Gender	Male	160	88.9 %
	Female	20	11.1 %
	Total	180	100 %
Age	30-39	60	33.3 %
	40-49	10	5.6 %
	50-59	10	5.6 %
	>=60	100	55.6 %
	Total	180	100 %
Respondents' Experience in the Sector	>5 Years	20	11.1 %
	>10 Years	20	11.1 %
	>15 Years	30	16.7 %
	>25 Years	110	61.1 %
	Total	180	100 %
Ownership of Respondents' Organization	Private	40	22.2 %
	Government	140	77.8 %
	NGO/Missionary	-	-
	Other	-	-
	Total	180	100 %
Functional Area/Division of the Respondent	Flight operations	27	12.8 %
	Marketing/Commercial	13	6.2 %
	Safety	19	9.0 %
	Quality	26	12.3 %
	Engineering/MRO	49	23.2 %
	Crew Training	32	15.2 %
	Legal Service	14	6.6 %
	Administration	7	3.3 %
	Finance	19	9.0 %
	Other	5	2.4 %
	Total	180	100%

Source: Researcher's Compilation (2020)

From the total population of the study, majority of the respondents (88.9%) were male whereas a few 11.1 % were female. Considering that the study targeted senior and managerial members of the sector, majority of the respondents (55.6 %) were beyond the age of 60. The second large age group (33.3%) falls between the age of 30 and 39. This shows a promising succession of youth in to the management.

4.2.5.1. Respondent's year of experience in the sector

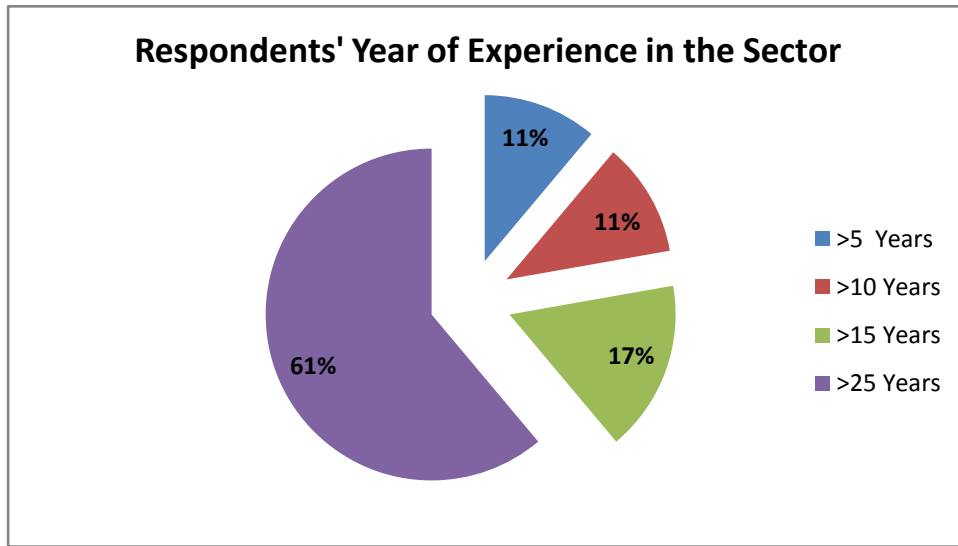


Figure: 4- Respondents' year of experience in the sector
Source: Researcher's Compilation (2020)

77.8 % of the respondents have more than 15 years of experience in the sector which is very crucial to capture relevant information regarding the study subject in Ethiopian context in that the seniority and working experience of respondents shows that they had understanding and experience to the topic under study.

4.2.5.2. Ownership of Respondent's Organization

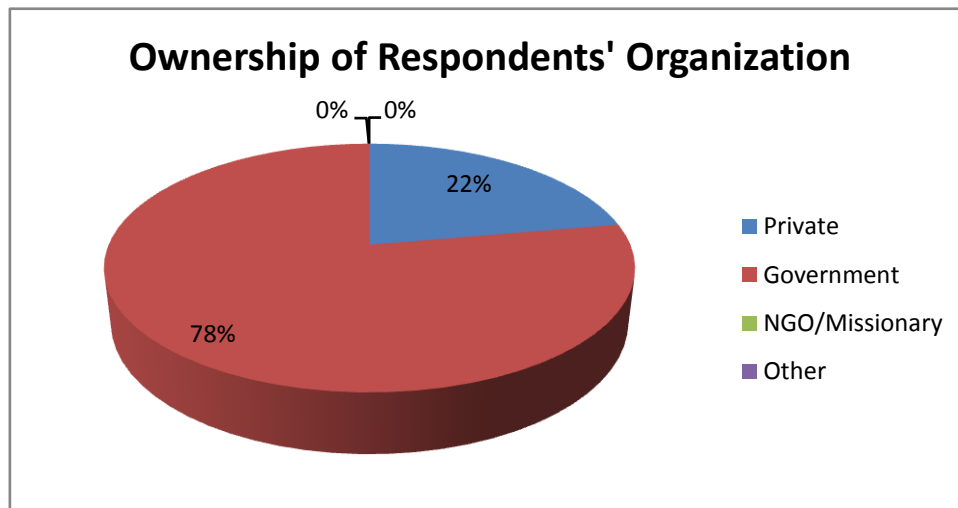


Figure 5: - Ownership of Respondents' Organization
Source: Researcher's Compilation (2020)

Majority of the respondent (77.8%) are from governmental air operator while the other 22.2% are from different private air operators. Hence, NGO/Missionary and other type of operators are not very common in Ethiopia.

4.2.5.3. Number of Aircraft owned by Respondents' Organization

Table 7- Number of Aircraft Owned//operated by Respondents' Organization

Number of Aircraft owned/operated	Frequency	Percent
1 - 5	10	5.6 %
6 -10	-	-
11- 15	-	-
16 -20	30	16.7 %
>=21	140	77.8 %
Total	180	100 %

Source: Researcher's Compilation (2020)

94.5 % of the respondents' organization own and/or operate more than 16 aircraft. However, more than 98% of aircraft are owned/ operated by Ethiopian Airlines and Abyssinian Flight Services PLC. From this, we learn that the aircraft existing in the country are highly dense in the government owned operator (EAL) than the private ones.

4.2.5.4. Core business areas of Respondents' Organization

Table 8- Core Business Areas of the Respondents' Organization

Core Business Areas	Frequency	Percent
Scheduled Flight	140	15.5
Unscheduled Flight	94	10.4
Air Charter (Passenger & Cargo)	164	18.2
International Flight	163	18.1
Domestic Flight	172	19.1
Medical Evacuation/ Air Ambulance	24	2.7
Aerial Application	32	3.6
Aerial Survey, Photography, Filming	55	6.1
Special Services, Company Operator	8	0.9
Helicopter Operator	16	1.8
Other	33	3.7
Total	901	100 %

Source: Researcher's Compilation (2020)

Majority of the respondents' companies (63.1%) are engaged in scheduled and non-scheduled flights (15.5% and 10.4% respectively) who are flying both International (18.1%) and Domestic (19.1 %) while only few operators (2.7%) are engaged in special services (0.9%) and helicopter

operation (1.8%). Operators engaging in air charter operation accounts for 18.2%. These figures indicate that an overlapping activity of scheduled, non-scheduled, Medical evacuation and other flight activities are common in Ethiopia and that special service operation is an untapped aviation stream.

4.2.5.5. Functional Area/Division of the Respondents

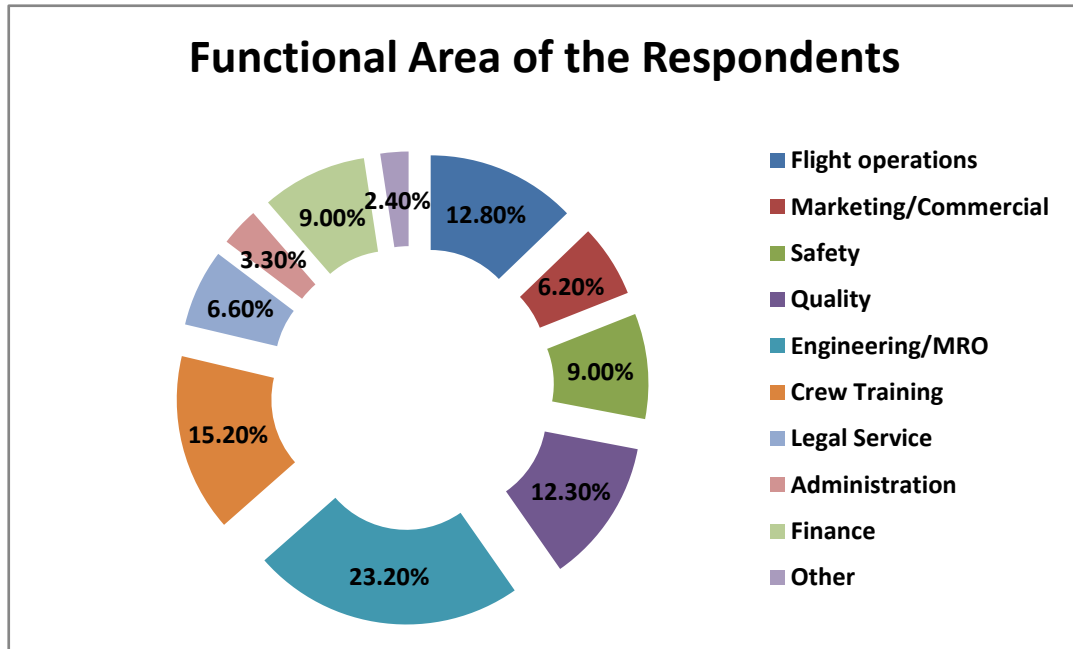


Figure 6 – Functional Areas/Divisions of the Respondents
Source: Researcher’s Compilation (2020)

Figure above (Figure 4) shows respondents from different divisions of functional areas in the aviation sector such as engineering/MRO (23.2%), crew Training (15.2%), flight operations (12.8%), aviation safety and quality (21.3%), etc... were involved in the study to capture the necessary information. The researcher believes respondents from these areas are capable to respond to technical questions posed to them due to their expertise in the stream of aviation.

The second part of the questionnaire sought to gather information directly relating to aircraft acquisition. These, includes questions regarding aircraft financing, legal firms /aviation lawyers, MRO, service support centers, certified spare part vendors, as well as national and

international regulatory requirements. In this section, respondents were asked to rank items and choose or place or mark on five point Likert-scales where they deemed appropriate.

4.2.5.6. Variables Relevant to Aircraft Acquisition

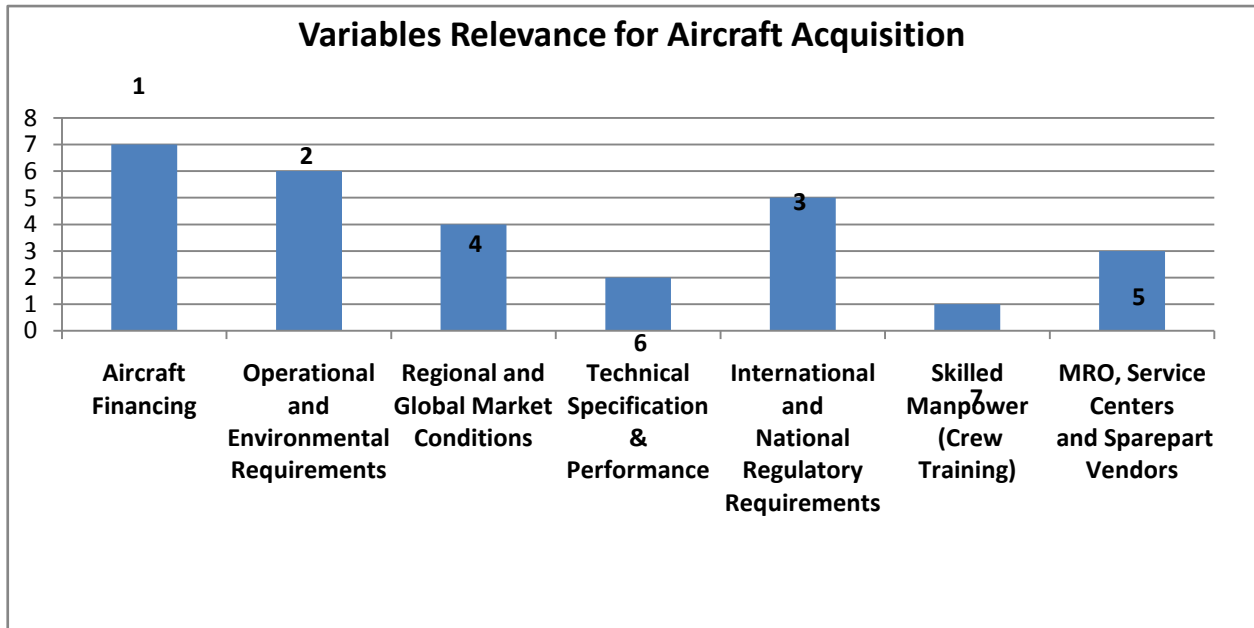


Figure 7 – Variables Relevant to Aircraft Acquisition
Source: Researcher’s Compilation (2020)

Respondents were issued with lists of items and were asked to rank them based on how relevant they thought these items were to aircraft acquisition. Responses were then encoded in to Microsoft Excel, categorically counted and measured for frequency through ‘CountIf’ and ‘SumIf’ functions. After doing so, results with respect to the total votes casted, were then ranked (after table transposition) by utilizing a ‘Rank’ formula. Results indicate that 17% of the respondents rated finance as the top relevant factor to aircraft acquisition followed by 15% of the respondents claiming operational and environmental requirements as the next relevant factor to aircraft acquisition. The next three relevant factors for aircraft acquisition that were equally rated by respondents were National and International regulatory requirements (14%), Regional and Global Airline market conditions (14%), as well as, MRO, Service Centers and Spare part vendors (14%) followed by Technical Specification and performance which were accounted with 13% and finally ranked was the skilled manpower (crew training) with (12%). This indicates, the

degree to which air operators focus on which variable of aircraft acquisition they consider most important.

4.2.6. Key Drivers of Change

Respondents were asked to choose the 5 most important ‘key drivers of change’ for regional and global airline market conditions summary of their responses is graphically presented below.

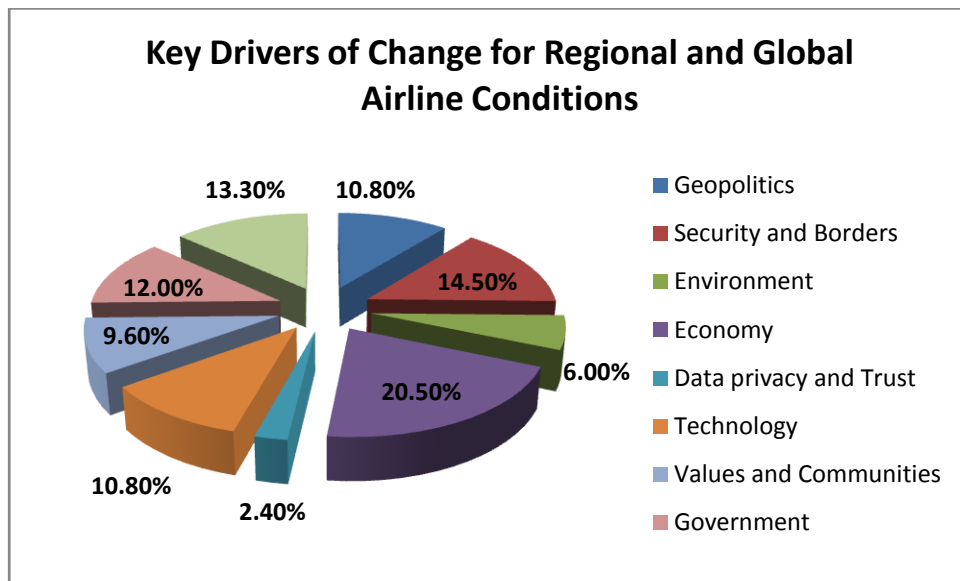


Figure 8 – Key Drivers of Change for Regional and Global Airline Conditions
Source: Researcher’s Compilation (2020)

As presented in the above chart, 20.5% of the respondents believed that geopolitics is the most important key driver of change, The next key driver of change as per the respondents was security and borders with 14.5%, thirdly placed was environment with 13.3% of the respondents followed by government which accounted for 12% of the respondents while both technology and economy each were chosen by 10.8% of the respondents. The rest were values and communities and data privacy and trust with 9.6% and 2.4%, respectively. From this we can deduce that respondents believe that a country’s geopolitics as a key driver of change can greatly impact the airline business similarly respondents also noted that security and borders, can also dictate the regional and global airline market conditions for a stable airline business.

4.2.7. Aircraft Financing

Acquisition of aircraft requires capital investment. Hence, to better understand the financing environment, several types of questions were posed to respondents. These questions included choices that aim to seek answers about the sources and types/modes of financing that were utilized by the major actors of the sector.

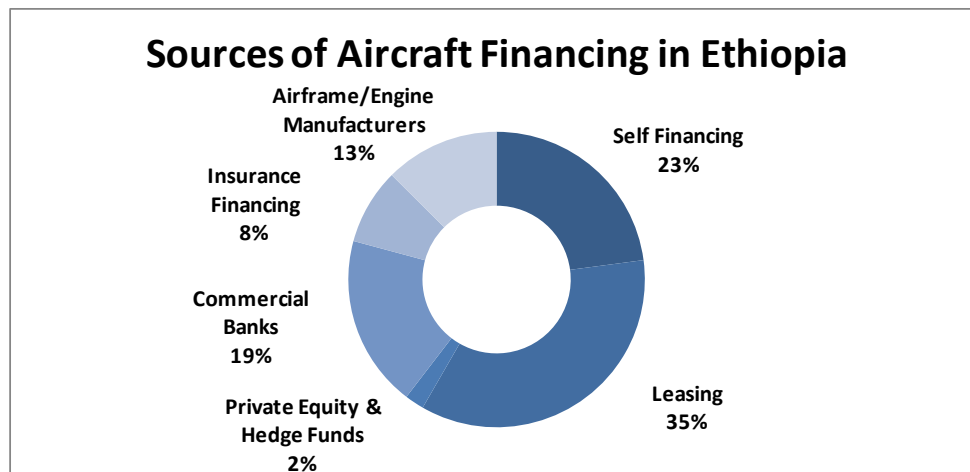


Figure 9-Sources of Aircraft Financing in Ethiopia
Source: Researcher's Compilation (2020)

The above pie chart (Figure9) shows more than one third of the respondents (35%) claimed that lease financing is the main source of their aircraft acquisition, while 23% of the respondents placed self-financing as their source. Commercial banks were thirdly placed by 19% of the respondents preceding financing of acquisition made by airframe/engine manufacturers with 13% of the respondents. This implies that lease financing, self-financing and financing commercial banks are the three most common forms of financing in Ethiopia while Insurance, Private equity & hedge funds are not so common in Ethiopian aviation sector.

The respondents were also requested to answer if there are sufficient financial sources in the country or not. And check if the institutes are willing and comfortable to avail finances for aircraft acquisition to which they were presented with 5 point Likert-scale questions (whose response range from 1= Strongly Agree to 5 = Strongly disagree) to determine the level of agreement to some of the statements presented.

The following table summarizes the analyses results.

Table 9 –Financial Environment in Ethiopia.

Financial support to aircraft acquisition in Ethiopia		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Mean	Standard Deviation
Q4. There are sufficient financial sources in Ethiopia to finance an aircraft acquisition project.	Freq.	10	10	10	90	60	180	4.0	1.05
	%	5.6 %	5.6 %	5.6 %	50%	33.3 %	100%		
Q5. There are provisions/frameworks and/or guidelines designed by financial institutes to finance aircraft acquisitions projects in Ethiopia.	Freq.	10	20	20	80	50	180	3.78	1.13
	%	5.6%	11.1%	11.1%	44.4%	27.8 %	100%		
Q6. Existing financial institutes in Ethiopia are willing and comfortable to avail finances for aircraft acquisition projects.	Freq.	10	40	10	110	20	180	3.72	0.87
	%	5.6 %	22.2 %	5.6 %	61.1 %	11.1 %	100 %		

Source: Researcher’s Compilation (2020)

As can be seen in Table9, majority of the respondents (83.3%) with ($M = 4.0$, $SD = 1.05$)disagreed to the statement that claims that ‘there are sufficient financial sources in Ethiopia to finance aircraft acquisition projects’. Furthermore, 72.2 % of the respondents with ($M= 3.78$, $SD = 1.13$)disagreedto the statement that says ‘there are provisions/frameworks and/or guidelines designed by financial institutes to finance aircraft acquisitions in Ethiopia’. Similarly, same amount of respondents 72.2 % believe with ($M =3.72$, $SD = 0.87$) that financial institutes in Ethiopia are not willing and comfortable to avail finances for aircraft acquisition. From this we can draw out that only limited financial sources are available to finance aircraft acquisition and that the guidelines presented from existing financial institutes in the country are lacking. Consequently, existing financial institutes in Ethiopia are not willing and comfortable to avail finances for aircraft acquisition projects with.

4.2.8. Legal Services/ Law Firms

To assess the legal service environment of the country, respondents were provided with two questions that were meant to check whether or not adequate numbers of aviation lawyers exist and if sufficient law firms were present to support and consult aircraft acquisition projects in the country. Table 10 shows summary of their responses.

Table 10 - Legal Services & Law Firms in Ethiopia

Legal services and Law firms in Ethiopia for the sectors		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Mean	Standard Deviation
Q7. There are adequate number of lawyers specializing in aircraft acquisition (aviation lawyers) in Ethiopia.	Freq.	-	20	30	70	60	180	3.94	0.97
	%	-	11.1 %	16.7 %	38.9 %	33.3 %	100 %		
Q9. There are adequate law firms that advise/consult legal and agreement matters for aircraft acquisition projects in Ethiopia.	Freq.	10	10	30	90	40	180	3.78	1.03
	%	5.6 %	5.6 %	16.7%	50 %	22.2 %	100 %		

Source: Researcher's Compilation (2020)

Table 10 indicates that 72.2% of the respondents with ($M = 3.94$, $SD = 0.97$) disagreed that 'there are adequate number of lawyers specializing in aircraft acquisition (aviation lawyers) in Ethiopia' while only 11.1% of the respondents think otherwise. This leaves the remaining 16.7% at a neutral position on the matter. This implies that there is lacking of lawyers in the country such as aviation lawyers that are specializing in aircraft acquisition.

Regarding availability of legal advising services in the sector, 22.2% of the respondents with ($M = 3.94$, $SD = 0.97$) strongly disagreed to the statement 'There are adequate law firms that advise/consult legal and agreement matters for aircraft acquisition projects in Ethiopia' while 50% disagreed putting the total respondents who disagreed to the statement at 72.22% meaning that the shortage of aviation lawyers in the country is evidenced once again with the lack of legal advising services in the sector.

4.2.9. Maintenance Repair and Overhaul (MRO), Service support Centers and Certified Spare part vendors as a Selection Criterion for an Aircraft Acquisition.

Another area that was assessed through questionnaire was related to Maintenance, Repair and Overhaul (MRO), Service Support centers and certified spare part vendors. Respondents were asked if the proximity of MRO facilities, responsiveness of service support centers and sufficient number of certified spare part vendors be considered as a selection criteria for an aircraft acquisition.

Table 11 - MRO, Responsiveness of Support Centers, and Certified Spare part vendors as a selection Criteria for aircraft Acquisition

Selection criteria		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Mean	Standard Deviation
Q9. The proximity of MRO facilities should be among selection criteria for an aircraft acquisition.	Freq.	70	90	10	-	10	180	1.83	0.96
	%	38.9%	50 %	5.6 %		5.6 %	100 %		
Q10. The responsiveness of service support centers should be considered as a selection criteria for an aircraft acquisition.	Freq.	90	80	-	10	-	180	1.61	0.75
	%	50%	44.4%	-	5.6 %	-	100 %		
Q11. The number of spare part vendors should be considered as a selection criteria for an aircraft acquisition	Freq.	90	80	10	-	-	180	1.56	0.60
	%	50%	44.4%	5.6 %	-	-	100 %		

Source: Researcher's Compilation (2020)

As can be seen in Table (11), greater number of agreement (88.9%) was witnessed with ($M = 1.83$, $SD = 0.96$) of the respondents claiming the proximity of MRO facilities as selection criteria while only 5.6% have indifferent opinion. This implies that aircraft acquisition, despite all requirements is met, the proximity of MRO facilities should also be critically observed to cut maintenance cost of the aircraft as well as put the aircraft in to function within short period of downtime.

Similarly, 94.4% of the respondent with ($M = 1.61$, $SD = 0.75$) believes that the responsiveness of service centers should be considered as a selection criteria for an aircraft acquisition. Exactly same amount of the respondents agreed that the number of certified spare part vendors be considered for selection criteria in aircraft acquisition meaning, apart from the closeness of

maintenance facilities, the responsiveness of support centers and availability of spare part vendors will help in reducing the downtime of aircraft for maintenance. Hence, should also be taken into consideration.

4.2.10. National and International Regulatory Requirements

Respondents were requested to answer questions that were directly related to ECAA’s involvement and restrictions on aircraft acquisitions. Summaries of the responses is found in the below table (Table12).

Table 12- National and International Regulatory Requirements

Statement relating to National and International Regulatory requirements.		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Mean	Standard Deviation
Q12. The regulatory body (ECAA) works closely with air operators to assist in aircraft acquisition.	Freq.	98	41	20	20	1	180	1.81	1.05
	%	54.4%	22.8 %	11.1 %	11.1%	.6 %	100 %		
Q13. The aircraft age restriction on acquisition of aircraft stated under ECARAS is correct.	Freq.	40	95	29	15	1	180	2.12	0.86
	%	22.2%	52.8%	16.1%	8.3%	.6 %	100 %		
Q14. The restriction on the number of seats on private operator’s aircraft stated under ECARAS is fair.	Freq.	7	86	22	61	3	180	2.82	1.00
	%	3.9%	47.8%	12.2%	33.9%	1.7%	100 %		

Source: Researcher’s Compilation (2020)

As can be seen in the above table (Table 12), more than half (54.4%) of the respondents with ($M = 1.81$, $SD = 1.05$) strongly agreed to the statement which reads ‘ECAA works closely with air operators to assist in aircraft acquisition’ while 22.8% mildly agreed to it. With regard to the ‘age restriction on acquisition of aircraft stated under ECARAS, 75% of the respondents believed with ($M = 2.12$, $SD = 0.86$) that the restriction is correct and beneficial while 16.1% have neutral position. Despite these agreements in response, respondents had divided opinion with regards to ‘the restriction on the number of seats on private operator’s aircraft’ i.e. while 47.8% of the respondents with ($M = 2.82$, $SD = 1.0$) agreed to the statement, 33.9% have chosen to disagree.

This entails that, the ECAA exerts the needed effort to assist air operators in adhering to the national and international requirements with respect to acquiring aircrafts. And, the age

restriction enforced by ECAA through ECARAS is justified for running safe and sound airline operation and for the wellbeing of passengers, cargo and the air operators themselves. However, the restriction on the number of seats on aircraft that private operator own and operate is not agreed and justified by many.

4.2.11. Skilled Manpower (Flight and Maintenance Crew Training)

Respondents were presented with statements to check if they think ‘there are sufficient aviation training institutes’, and wheatear or not ‘their company considers the training requirements’ before aircraft acquisitions. Summary of their responses are presented below.

Table 13- Requirements of Skilled Manpower

Requirements of skilled humanpower (Flight and maintenance crew training)		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Mean	Standard Deviation
Q16. There are sufficient aviation training institutes that offers ‘type rated’ trainings for crew (flight and technicians) in Ethiopia.	Freq.	13	40	6	104	17	180	3.94	1.14
	%	7.2 %	22.2 %	3.3 %	57.8%	9.4 %	100 %		
Q17. My company considers the training requirements among selection criteria before an aircraft acquisition.	Freq.	17	99	20	20	7	180	2.11	0.98
	%	9.4%	55.0%	16.7%	15.0%	3.9	100 %		

Source: Researcher’s Compilation (2020)

As can be seen the above, more than half(67.2%) of the respondents with ($M = 3.94$, $SD = 1.14$)believed that there are no sufficient aviation training institutes that offer ‘type rated’ training for crew (flight and technicians) in Ethiopia while 29.4% believed that the existing institutes to be sufficient. With regards to the selection criteria, 64.4% of the respondents with ($M = 2.11$, $SD= 0.98$) think that their company considers the training requirements among selection criteria for an aircraft acquisition while 16.7% have neutral position on the matter.

This bring about that,there is present deficient in aviation training facilities in the country to feed the required skilled man power in to the sector meaning that air operators are lead to reconsider their interest in a particular aircraft only for its requirement of skilled manpower. Thus, they are made to consider the requirements of skilled manpower as a selection criterion for an aircraft acquisition.

4.2.12. Technical Specifications and Performance

Respondents were presented with statements containing different variables such as aircraft size, dimension, weight, speed, performance range, as well as engine type and manufacturer. Summary of the responses are found in Tables 13,14, 15,16, and 17, consecutively.

4.2.12.1. Size and Dimension

Table 14 - Size and Dimension of an Aircraft

Part III. Q1. The following SIZE AND DIMENSION aspects must be considered during selection of aircraft for acquisition.									
SIZE AND DIMENSIONDetails		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Mean	Standard Deviation
- Cabin Height	Freq.	80	80	20	-	-	180	1.67	0.66
	%	44.4%	44.4%	11.1%	-	-	100 %		
- Cabin Width	Freq.	80	80	20	-	-	180	1.67	0.66
	%	44.4%	44.4%	11.1%	-	-	100 %		
- Cabin Length	Freq.	70	80	30	-	-	180	1.78	0.71
	%	38.9%	44.4%	16.7%	-	-	100 %		
- Cabin Volume	Freq.	70	90	20	-	-	180	1.72	0.65
	%	38.9%	50%	11.1%	-	-	100 %		
- Cabin Door	Freq.	70	90	20	-	-	180	1.71	0.66
	%	38.9%	50.4%	11.1%	-	-	100 %		
- Internal Baggage Volume	Freq.	70	100	10	-	-	180	1.67	0.57
	%	38.9%	55.6%	5.6%	-	-	100%		
- External Baggage Volume	Freq.	50	90	30	10	-	180	2.00	0.81
	%	27.8%	50%	16.7%	5.6%	-	100%		
- Crew & Executive Seats	Freq.	70	90	20	-	-	180	1.72	0.65
	%	38.9%	50%	11.1%	-	-	100%		
- Passenger Seats	Freq.	80	90	10	-	-	180	1.61	0.59
	%	44.4%	50.0%	5.6%	-	-	100%		

Source: Researcher's Compilation (2020)

As it is shown in the above table, more than two third of the respondents have shown great level of agreement on all size and dimension variables. This is evidenced in their response that majority of the respondent have chosen to agree with an aggregate of 83.3% ($M = 1.66$, $SD = 0.66$). The cabin height, width, length and volume could dictate the loading capacity and seating arrangement of an aircraft as more rooms mean more space. The internal and external baggage volume can also be an indicator whether or not the aircraft is suited for passenger, cargo or utilization for both.

4.2.13. Speed Variables of Aircraft

Table 15 - Speed and Performance of an Aircraft

Part III. Q2. The following Speed Variables must be considered during selection of aircraft for acquisition.									
AIRCRAFT SPEED VARIABELS		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Mean	Standard Deviation
Maximum Cruising Speed	Freq.	80	60	30	10	-	180	1.83	0.90
	%	44.4%	33.3%	16.7%	5.6%	-	100 %		
Minimum Cruising Speed	Freq.	60	60	50	10	-	180	2.06	0.94
	%	33.3%	33.3%	27.8%	5.6%	-	100 %		
Normal Cruising Speed	Freq.	70	90	20	-	-	180	1.72	0.65
	%	38.9%	50.0%	11.1%	-	-	100 %		
Long Range Speed	Freq.	60	70	20	10	-	160	1.88	0.86
	%	33.3%	38.9	11.1%	5.6%	-	100 %		

Source: Researcher's Compilation (2020)

Similarly, majority of the respondents have agreed to all of the speed variables presented. This is evidenced with agreement of 77.7% ($M = 1.83$, $SD = 0.90$) and 66.6% ($M = 2.06$, $SD = 0.94$), respectively, for Maximum and Minimum cruising speeds. Correspondingly, 88.9% ($M = 1.72$, $SD = 0.65$) and 72.2% ($M = 1.88$, $SD = 0.86$) agreements were expressed for normal cruising and long range speeds, respectively. On the contrary, less significant amount of the respondents had chosen to stand neutral and chose to disagree. This implies that aircraft operators consider aircraft speed variables as an important selection criterion for aircraft acquisition. Meaning speed of aircraft are ideal for operational efficiency.

4.2.14. Aircraft Weight

Table 16 - Weight Details of an Aircraft

Part III Q3. The following AIRCRAFT WEIGHT DETAILS must be considered during selection of aircraft for acquisition.									
AIRCRAFT WEIGHT		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Mean	Standard Deviation
Maximum Takeoff Weight	Freq.	110	60	10	-	-	180	1.44	0.60
	%	61.1%	33.3%	5.6%	-	-	100 %		
Basic Operating Weight	Freq.	110	60	10	-	-	180	1.44	0.60
	%	61.1%	33.3%	5.6%	-	-	100 %		
Usable Fuel	Freq.	110	60	10	-	-	180	1.44	0.60
	%	61.1%	33.3%	5.6%	-	-	100 %		
Payload with full fuel	Freq.	110	60	10	-	-	180	1.44	0.60
	%	61.1%	33.3%	5.6%	-	-	100 %		

Maximum payload	Freq.	110	60	10	-	-	180	1.44	0.60
	%	61.1%	33.3%	5.6%			100 %		

Source: Researcher's Compilation (2020)

By the same token, 94.4% with an aggregated mean and standard deviation of ($M = 1.44$, $SD = 0.60$) had agreement on the importance of all aircraft weight variables (Maximum Takeoff, Basic Operating weight, Usable fuel, payload with full fuel, and maximum payload) while only 5.6% had neutral opinion. This implies that aircraft weight, similar to the speed variables is another aspect that air operators consider due to the operational and environmental requirements.

4.2.15. Engine Type and Manufacturer

Respondents were presented with questions that requests if number, model and manufacturer of engine should be considered during selection of aircraft for acquisition.

Table 17 - Engine of an Aircraft

Part III Q4. The following ENGINE TYPE AND MANUFACTURER details must be considered during selection of aircraft for acquisition.									
ENGINE TYPE & MANUFACTURER		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Mean	Standard Deviation
Number of Engine	Freq.	80	80	20	-	-	180	1.67	0.66
	%	44.2%	44.2%	11.0%	-	-	100 %		
Model of Engine	Freq.	90	80	10	-	-	180	1.56	0.60
	%	49.7%	44.2%	5.5%	-	-	100 %		
Manufacturer of Engine	Freq.	80	90	10	-	-	180	1.61	0.59
	%	44.2%	49.7%	5.5%	-	-	100 %		

Source: Researcher's Compilation (2020)

The above table (Table 17) presents summary of responses concerning engine type and manufacturers. Per se, greater part of the respondents 88.4% with ($M = 1.67$, $SD 0.66$), 93.9% with ($M = 1.56$, $SD 0.60$), and 93.9% with ($M = 1.61$, $SD 0.59$) were inclined to agree for number, model and manufacture of engines, respectively, while 11.0% and 5.5% tend to have neutral position. From this we can obtain that, air operator also observe the number of Engine as well as the make and model in their review of aircraft for acquisition.

4.2.16. Performance Range

Another area that was assessed through the questionnaire was the performance range which is concerned about the endurance of the aircraft i.e. it helps to determine how far the aircraft can fly at night with/without the aid of instruments (through visual aid alone) not having to stop for a refuel. Furthermore, it is also related to how long it has to roll or slide for takeoff and landing (whether or not it requires a large/short field). The rate of climb is another variable presented to respondents in which the next table (Table 17) summarizes the respondents' opinion.

Table 18 - Performance of an Aircraft

Part III Q5. The following PERFORMANCE RANGE details must be considered during selection of aircraft for acquisition.									
PERFORMANCE RANGE		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Mean	Standard Deviation
IFR Range	Freq.	100	60	20	-	-	180	1.56	0.68
	%	55.6%	33.3%	11.1%	-	-	100 %		
Ferry Range	Freq.	70	80	30	-	-	180	1.78	0.71
	%	38.9%	44.4%	16.7%	-	-	100 %		
VFR Range	Freq.	80	70	30	-	-	180	1.76	0.73
	%	44.4%	38.9%	16.7%	-	-	100 %		
BFL	Freq.	90	60	30	-	-	180	1.70	0.75
	%	50.0%	33.3%	16.7%	-	-	100 %		
LDF	Freq.	110	50	20	-	-	180	1.50	0.68
	%	61.1%	27.8%	11.1%	-	-	100 %		
Rate of Climb (Ft/Min)	Freq.	90	70	20	-	-	180	1.61	0.68
	%	50.0%	38.9%	11.1%	-	-	100 %		

Source: Researcher's Compilation (2020)

The above table (Table 18) illustrates that most respondents had an agreement on all performance range variables; this is evidenced with 88.9% agreement for IFR range, LDF and Rate of Climb with an aggregate mean and Standard deviation of ($M = 1.5$, $SD = 0.68$) while 83.3% ($M = 1.74$, $SD = 0.60$) agreed for Ferry Range, VFR Range and Rate of climb. However, 16.7% of the respondents had neutral opinion on BFL, Ferry Range and VFR Range. This shows that assessing the performance range of an aircraft among others is equally important criteria for aircraft attainment.

4.3. Analysis of Qualitative Data

In addition to the qualitative data obtained through open-ended questions in the questionnaire, consecutive interviews were made with the key informants. These informants were selected purposively because of their exposure in aircraft acquisition. The interviews were made both in person and via telephone. Interviewees included stakeholders from “Director of Aircraft Registration & Airworthiness” in ECAA and an employee from loan section in “Bank of Abyssinia”, an aviation lawyer from “TeshomeGebre-Mariam Bokan Legal Advisors” as well as managing/deputy managing director of two private air operators. The summary of qualitative data obtained through questionnaire and the key informant’s interview in all togetherness are thematically grouped and presented as follows:

4.3.1. Aircraft Financing

Participants in the interview agreed that financing of aircraft acquisition requires huge capital and the only financial institution support this endeavor in the country are commercial banks. These banks consider aviation projects like any other financing. Hence, they mostly require operators to raise 30%, which is very huge sum of money, of the principal amount for Pre-Delivery Payments. The problem with the existing financial institutions in the country is that they do not have clear understanding and prior experience about the uniqueness of this sector, thus making funding very difficult. As a result of their unwillingness to venture in to a new sector such as aviation, it has made it very discouraging for actors in the sector. From the operators stand point, banks are rather cheerful to fund industrialists rather than an aircraft acquisition because they do not have clear picture of the challenges and opportunities that comes along with it - they consider aircraft financing as a risky business. The banks were also adamant to this problem when questioned.

Another challenge stated was the shortage of foreign currency in the country i.e. both for pre-delivery payments as well as debt payment. According to the operators, the restriction of movement for hard currency by the national bank has made it very difficult to liberally move their own earnings. Topped with the aforementioned problem is the government not allowing foreign investors to partner with local banks for acquisitions as the sector is closed for foreign nationals. Investors believe that a little margin of liberalization could do the sector lots of wonder.

4.3.2. Insurance

According to the managing directors of air operators, one of the highest costs of running an aviation business is the cost of aircraft insurance. The local insurance companies have limitations on the amount of coverage they are able to provide. Hence, they go out to explore reinsurance markets in the UK, UAE, and Russia among others. As it stands, the portion of coverage they are ready to offer does not exceed 10 % of each aircraft's value. As a result, negotiations start early 3-4 months of policy expiry even with an increased premium rate. With all this, significant amount of scarce foreign currency is spent each year on to the London, Dubai and Moscow insurance markets.

4.3.3. Knowledge and Understanding of the Sector

Owners of private air operators, who are also managing directors of their respective company believes that the requisite of large finance put aside, the sector requires deep knowledge and understanding of its dynamism hence making it less attractive for investors of other business discipline. As a result, only those who have had previous exposure and the financial capability are interested.

They also deem that the lack of understanding on the part of the concerned authorities and the lack of support by the government to the sector as another challenge. They stress that although the government made aviation free of any taxation, lacking details in the provisions of policy specially tailored for private stakeholders in the country has made it challenging.

Another issue discussed by the key informants was the protection of the national carrier by the government. They insist that the government is partial in that all possible pockets are generously given to the national air-carrier excluding the tiny ones.

4.3.4. Regulatory body

The seat restriction on aircraft by ECAA that "...private operators are allowed to operate a maximum seats capacity of 50 ..." was also mentioned as a problem as to why the sector is not developing. The operators are unable to diversify their services limiting them to smaller aircraft for unscheduled - air charter operations only.

On the contrary, the national flag carrier is favored to operate with unlimited seat capacity. Most private operators agreed that the sector is under the monopoly of Ethiopian Airlines Group as all airports and aerodromes are under the national air carrier. Due to this fact, small ones have no

room for expansion and operate on their own. Some argue that the private operators are buried by the overwhelming success of EAL.

4.3.5. Legal Firms and Consultations

Another challenge raised by the air operators and legal consultants is that there are only a few counted legal firms and lawyers in Ethiopia specializing in aviation. Putting aside the very few company lawyers, most legal consultants in the country are specialized in family and criminal law. The very few ones that operators work with are ‘half-baked’ and are not very serious about aviation because the private aviation sector in the country is one of the weakest in Africa. Moreover, they are very expensive for the service they offer and do not provide the service at the level of professionalism expected.

4.3.6. Lack of Adequate Planning and Evaluation

The lack of proper planning for an aircraft acquisition was stated as another problem. Most operators embark on acquiring aircraft without having an in-depth analysis. They do not deeply assess if the aircraft at hand is fit for their mission or not. They simply invest all the money at their disposal. This has led some to a serious problem such as bankruptcy to a point of no recovery and closing down due to the large money involved in it. Evaluation of aircrafts’ technicalities that they prefer is mostly not carried out by professionals of the stream instead; decision is solely made by their desire and operational requirements. A meticulous document evaluation and aircraft inspections are carried out once after they tie themselves to the deal and bring the aircraft.

4.3.7. Proximity, Responsiveness and Availability of MROs, Service Support Centers and Certified Spare Part Vendors

The proximity of MRO to the operating base, responsiveness of service support centers and availability of certified spare part vendors is another key aspect of aircraft acquisition that air operators must not overlook. Interviewees have insisted that this alone can make or break a deal for an aircraft acquisition. According to the air operators, the only MRO service provider in the country is of EAL which is engaged in maintaining company airplanes that are very heavy and highly sophisticated. Although the facility is open for airliners in the country and around the globe, EAL is engaged in maintaining only heavy aircraft and their engines and not for the aircraft in the General Aviation. As a result, other small air operators are forced to fly out their

aircraft to another country (mostly to Kenya, Uganda, Tanzania and South Africa) to get maintenance services and hourly inspections. This has limited the operators to only line maintenance activities. When asked of their capability (skill wise), all the air operators claimed that they have ECAA certified aircraft technicians and engineers with a valid license to the job. Nevertheless, the lack of aircraft maintenance facility such as hangars is causing them to fly out their aircraft even for the basic hourly aircraft inspection works. This leaves them painful cost of maintenance not to mention the fuel and crew accommodation in addition to the opportunity lost during flying the aircraft from and to the facilities abroad.

With regards to the responsiveness of service support centers, most operators are not satisfied for the aircraft they own from European manufacturers i.e. due to their delayed responses to support requests. Dissimilarly, aircraft leased/purchased from Canadian and American manufacturers are relatively engaged and responsive to any type of requests. High officials of these manufacturers are also known to periodically come for a field visit themselves if not through their regional sales representatives only to make sure that airlines are satisfied with the service they are receiving.

4.3.8. Well Trained Workforce (Crew Training)

Operators insist that the investment on human resource is another draining factor to an aircraft acquisition. They claim to have spent a great sum of money both domestically and abroad to train their workforce to bring them up-to the standard required only to lose them for another company (local or abroad) for a better wage without them properly recouping their spending. As a result, they themselves sometimes tend to hire well trained personnel even from abroad to meet these requirements.

4.4. Discussion

According to Downey (1991), the airline business is capital-intensive. The price list at Boeing or McDonnell-Douglas starts at about \$25 million for a twin-engine, narrow-body aircraft, and goes up to approximately \$130 million or more for a widebody aircraft capable of transcontinental travel (Current Issues in aircraft finance, 1991). The finding of this study also shows that aircraft financing is a very relevant part for aircraft acquisition as it was ranked 1st by respondents with the majority vote.

Findings also show that, although aircraft acquisition requires very large sum of money, the financing environment of the country is rather not well developed as the only financing institutes in the country to avail loans are commercial banks. Even with that, the banks are not helpful and capable to avail sufficient finances. Results of quantitative analysis also shows that 35% of the respondents have chosen lease financing as the most common mode of financing in Ethiopia followed by 25% of the respondents voting for self-financing. Only 19% of the respondents have previously had experience debt financing whereby, their acquisition was financed by commercial banks whereas, 13% had utilized airframe/engine manufacturer's funds.

Another aspect of finance challenging the sector is shortage of foreign currency. Due to the global nature of aviation, all transactions of aircraft acquisitions and spare part purchases takes place by using foreign currency (USDollar and EUROS). However, the controlled usage and movement of foreign currency by the financial regulatory of the country (National Bank of Ethiopia) has made it almost impossible even to utilize their own earnings. Additionally, the unwillingness and inexperience of the financial institutes topped with their lack of guidelines has made those who want to acquire aircraft to give up and lookout for funding from abroad which is excessively hemorrhaging themselves and the country financially with high interest rates of foreign currency. i.e. even when the commercial banks are willing to finance such projects, there is chronic lack of foreign currency to facilitate them with. (Downey, 1991) also suggests under these circumstances, the airline capital budgeting process, particularly the aircraft financing process, deserves a careful analysis. A difference of a few basic points in financing costs has enormous significance in a hundred million dollar transaction. Achieving the optimum financing arrangements is a complex and not entirely quantitative exercise (Current Issues in aircraft finance, 1991).

Furthermore, banks in Ethiopia require collaterals that are valued to equal the sum they are willing to loan out. This leads to freezing of operators' properties and fixed assets. Additionally, an interest rate of 14% -19%, which is very high, is applied to the loans. According to the annual report of the National Bank of Ethiopia, sectoral distribution of credit from the banking system in Ethiopia for the year 2018/19 shows only 1.6% share of credit for the Transport and Communication sector together.

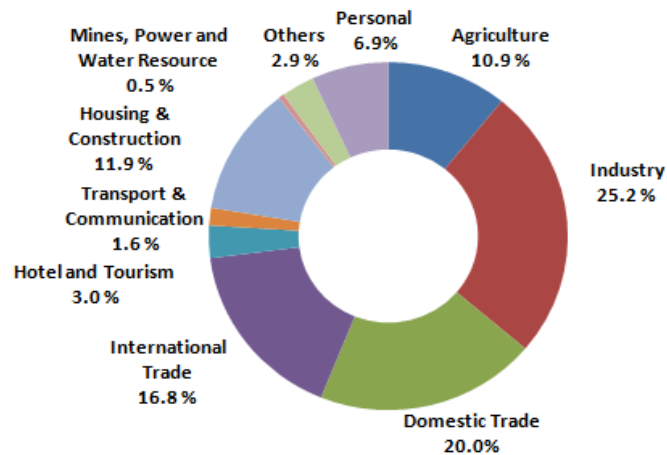


Figure 10: Sectoral Distribution of Credit from the Banking System in 2018/19
Source: The National Bank of Ethiopia(NBE)

As can be seen above, the transport & communication sector together has not even reached the amount of credit distributed for personal use which stands at 6.9%. Likewise, the trend for the past three years also signifies that there exists steady reduction in the amount of credit introduced to the sector. Below diagram shows how the distribution of credit in the sector of transport has reduced over the course of the past three years.

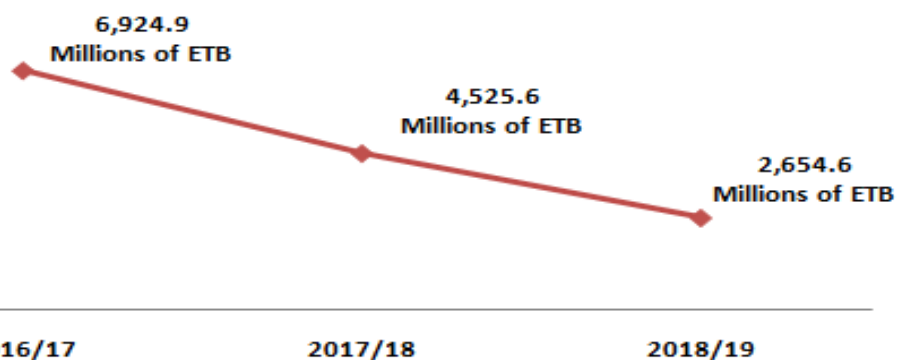


Figure 11: Distribution of Credit for Transport & Communication sector from the Banking System in Ethiopia (Year 2016-2019)
Source: The National Bank of Ethiopia(NBE)

Another area of topic covered through was the national and international requirements of regulatory with regard to aircraft acquisition. As indicated under the literature review section, understanding the national and international requirements of regulatory as well as conventions is significant to facilitate an aircraft acquisition. This is backed when the respondents placed national and international requirement of regulatory as the 3rd most relevant for aircraft acquisition. These regulatory requirements could be originating from ICAO, EASA, FAA or any other recognized aviation unions in the globe such as IATA. However, it is ECAA's mandate to enforce those requirements as stated under 'proclamation for civil aviation' (PROCLAMATION NO 616/2008). With regards to the regulatory body, majority of the respondents (77.2%) agreed that ECAA works closely with air operators to assist in aircraft acquisitions. ECAA, as a regulatory body responsible to control and standardize every activity in the aviation sector in Ethiopia, is expected to consolidate and modernize the aviation laws and to bring them to and international standards by strengthening its regulatory, administrative, technical and supervisory capabilities for better regulation of civil aviation to meet the needs for a safe, secure, regular, efficient and economic civil aviation system. In order to operate an aircraft, an operator must have an air operator certificate therefore the candidate operator shall pass through the certification process to acquire AOC.

The certification process is designed to ensure and verify that prospective AOC holders understand and are capable of fulfilling the regulatory requirements and also the ability of the operator to comply with the ECAA requirements as published in ECARAS and with the applicable international standards (ICAO Annexes & ICAO Documents) pertaining to the operation of aircraft.

According to ECARAS, there are five phases in the air operator certification process namely Pre-application, Formal Application, Document Evaluation, Demonstration and Inspection, and Certification. However, respondents had divided opinions on the number of seats allowed for private air operators. Some believe such restrictions are put in place to protect the interests of the national flag carrier (EAL) and limit the private air operators from competing while others relate it to the size and complex nature of big aircraft reckoning private air operators have operational and maintenance limitations to own and operate such aircraft.

Notwithstanding the above, 75% of the respondents had agreements with the age restriction of aircraft. These respondents associated the aircraft age restrictions imposed by ECAA with maintaining high safety standards as the aircraft are known to get hazardous with age. It was also stated under ECARAS that one of the main requirements of the regulation to conduct Air transport operations, in private and General Aviation services is on Aircraft's service life. Such that the restriction on aged aircraft is related to the safety of the operation in general and for safety of passengers in particular which will not be compromised. Recent studies conducted by ICAO suggest that one of the main reasons for airplane accidents is the age of aircraft used for operation.

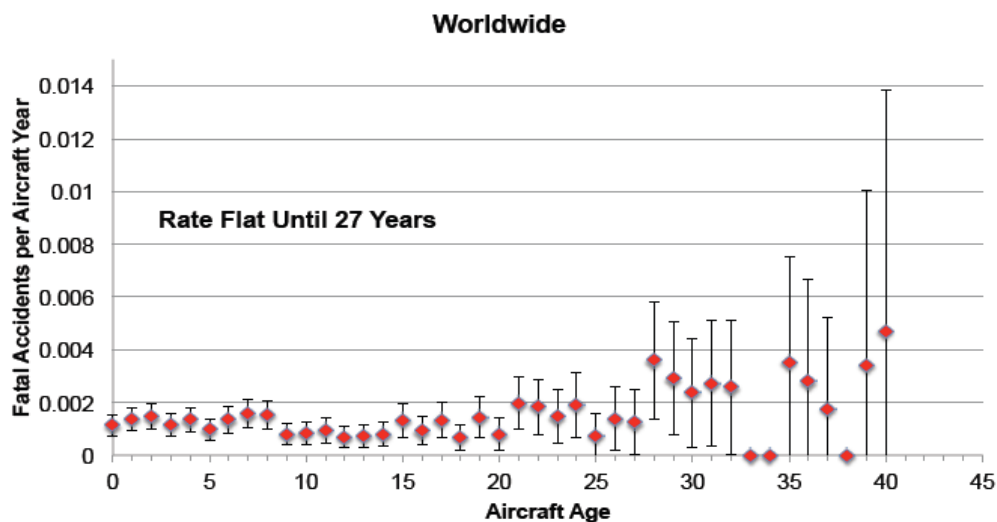


Figure 12 - Fatal Accident Rate vs. Aircraft Age
Source: Ethiopian Civil Aviation Authority (Ref. ICAO)

As can be seen in the above graph (Figure 12), the rate of fatal accidents with respect of the age of aircraft looks relatively flat until 27 years then starts to pick dramatically afterwards. Same study suggested that the rate of accident in general also begins to rise at the same age. Hence, the response of participants in this study is even backed up with an empirical study conducted by ICAO.

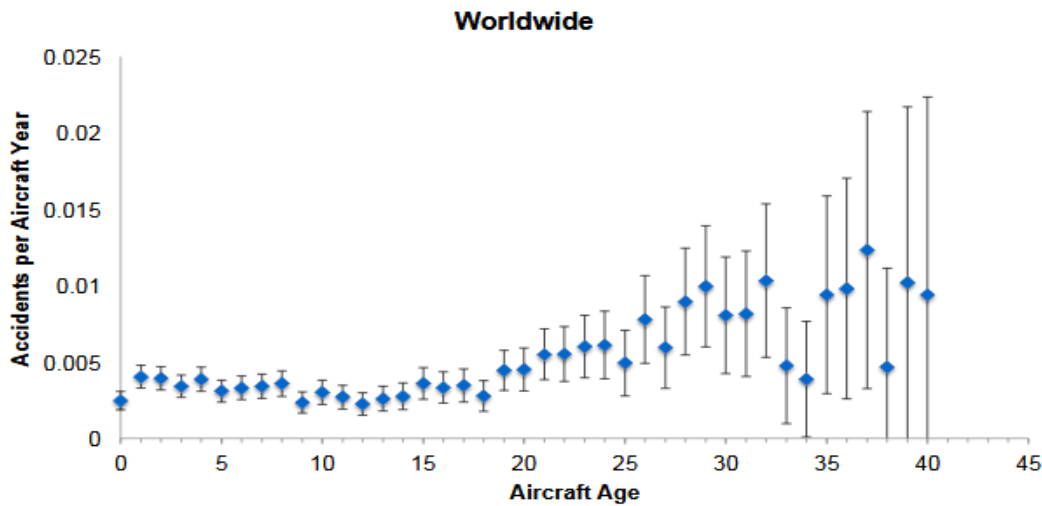


Figure 13- Accident Rate vs. Aircraft Age
Source: Ethiopian Civil Aviation Authority (Ref. ICAO)

We can also observe in the above figure (Figure 13), that the rate of accident increases as does the age of aircraft. Accordingly, aircraft are not eligible for registration in Ethiopia if it is more than

- 22 years of age since manufactured and to be engaged in passengers transport and
- 25 years of age since manufactured and to be engaged in Cargo transport or an Aerial work.(ECARAS-Part 4, 2013)

In spite of their agreement with the age restriction, key informants interview indicates that most believe the government has not given enough attention to the sector. They believe government is deceived with the overwhelming success of EAL. Considering the untapped potential of the aviation sector, they believe it could have contributed the lion’s share of the GDP. This is justified in that some small air operators in the general aviation such as Abyssinian Flight Services Plc. has been paying profit taxes amounting over 6 million ETB on average each year for the past five to ten years. Backed with this evidence, one can argue that facilitating the aviation sector can help accelerate growths of other economic sectors such as tourism and import/export and in addition to its own contribution to the economy.

Downey (1991) argues that the current legal environment is the setting for interaction between industry and investor, borrower and lender, lessee and lessor, -an interaction (as he puts it), “as much a romance as a negotiation, as much a marriage as a contract”, certain legal aspects are

attractive, while others seem repulsive (Current Issues in aircraft finance, 1991). Although the literature stresses the importance of detailed review of agreements, the lack of adequate law firms and legal consultations for aviation has been another ‘bottle-neck’ for the sector. 72.2% of the respondents believe that there are insufficient number of law firms and aviation lawyers. Similarly, key-informants interview backs this claiming that most lawyers and legal consultants in the country are specializing in family and criminal laws instead of aviation. Accordingly, this has made air operators’ desire for legal consultation unattended. All of the aviation academies (although few) are busy fulfilling operational and administrative requirements by training professionals such as pilots, cabin crew, ground technicians and marketing personnel. Hence, the legal aspect is mostly overlooked. As a result, air operators are exposed to draining fees to receive basic legal advises from those few and abroad. Even with that, most are not satisfied with the level of professional consultation they are receiving.

Aircraft leasing and/or lease-purchasing agreements have conditions that are precedent and subsequent to the aircraft delivery such that both parties in the transaction are secured. Thus, to assure this security, lawyers and legal syndicates are involved. These conditions (precedent and subsequent) include but are not limited to as stipulated in **AIRCRAFT LEASE AGREEMENT** between a private air operator and **AFRICAIR AVIATION LEASING LLC (“Lessor”)**:

Condition Precedents:

On or before the delivery of aircraft, and as a condition precedent to the Lease/Lease-purchase in terms hereof, the Lessee/Buyer shall deliver to the Lessor/Seller, in form and substance satisfactory to the Lessor/Seller:

- (a) Copies, certified by an officer of the Lessee/Buyer of changes as [Date of Agreement] to the Lessee’s/Buyer’s **certificate of incorporation, and memorandum and articles of association** in force at the date of such certification;
- (b) The **Board Resolutions approving the lease/purchase**, duly certified by shareholders, general manager or the secretary, of the Lessee/buyer in accordance with its terms;
- (c) The Officers’ Certificate, duly signed by an officer of the Lessee/Buyer;

- (d) the ***De-Registration Power of Attorney***, duly executed by the Lessee/Buyer under its common seal in accordance with its articles of association;
- (e) evidence that any required ***import license***, and all customs formalities, relating to the importation of the Aircraft into Ethiopia as contemplated by the Agreement, have been obtained or complied with, and that such ***importation is exempt from any Taxes*** or, ***if subject to any Taxes***, that the same have been duly paid;
- (f) Copies, certified by an officer of the Lessee/Buyer, of:
 - (i) The Lessee's/Buyer's valid air services license, issued by the Ethiopian Civil Aviation Authority, authorizing the provision by the Lessee/Buyer of air services of the kind provided by the Lessee/Buyer, and of such air services as are proposed to be provided using the Aircraft;
 - (iii) All other consents (if any) as may be required by the Lessee/Buyer in relation to, or in connection with, the operation of the Aircraft;
- (g) The ***Aviation Charges Letters***, duly signed by an officer of the Lessee;
- (h) the ***De-registration Consent*** duly signed by an officer of the Lessee and undated
- (i) Evidence that the ***Request for Approval of Lease/Lease-purchase*** duly signed by an officer of the Lessee/Buyer has lodged with the Aviation Authority;
- (j) Evidence that the Ethiopian Civil Aviation Authority (ECAA) has ***approved the Lease/lease-purchase Agreement***;
- (k) Evidence that all consents required for the Lessee/Buyer to meet its obligations in terms of the Aircraft Lease Agreement have been obtained or effected, on an unconditional basis, and remain in full force and effect, and that the Aircraft has been, and remain, insured in accordance with the terms of the Agreement;
- (l) ***Letter from the National Bank of Ethiopia*** evidencing registration and approval of the Aircraft Lease/lease-purchase Agreement and payment in the Contractual Currency;
- (m) Evidence that all consents necessary for any matter or thing contemplated by the Aircraft Lease/lease-purchase Agreement, and for the legality, validity,

enforceability, admissibility in evidence, and effectiveness thereof, have been obtained or effected on an unconditional basis, and remain in full force and effect; and

- (n) Such other and further documents as may be required by law or which Lessor may reasonably request.

Condition Subsequent

As soon as practicable as but no later than 1 month after delivery, and as a condition subsequent to the obligation on the part of the Lessor/Seller to lease/lease-purchase the Aircraft in terms hereof, the Lessee/Buyer shall deliver to the Lessor:

- a) The valid *certificate of airworthiness* of the Aircraft, issued by the Ethiopian Civil Aviation Authority;
- b) The valid *certificate of registration* of the Aircraft in the Register, issued by the Ethiopian Civil Aviation Authority, and reflecting the respective interests in the Aircraft of the Lessor/Seller as owner, and the Lessee as lessee;
- c) The **IDERA (Irrevocable De-Registration and Export Request Authorization)**, duly signed by an officer of the Lessee/Buyer and acknowledged by the Ethiopian Civil Aviation Authority.

Listed above are some common requirements that an aircraft lessee or buyer required to fulfil prior from an acquisition and/or after delivery.

With the global revenue traffic for international and domestic services showing a steady growth over the past 10 years (Air Transport Reports, 2017), it presented with huge potential in the industry that made commercial airlines to expand their operation in the global market. These expansions of operation would not be realized without skilled man power of ground handling personnel, aircraft technicians as well as flight and cabin crews. Same is true for an aircraft acquisition as these machines would need personnel that would operate on them. However, 67.2% of the respondents believe that there are no sufficient aviation training institutes in the country. As a result of shortage in skilled man power, many air operators are forced to employ

foreigners even from neighboring countries. Furthermore, 64.4% of the study participants said their company considers the training requirements before acquiring aircraft.

The other piece which is very critical for an aircraft acquisition is related to the technical specifications and performance range of an aircraft. The importance of answering operational and environmental requirement is noted as it was ranked second by respondents (next to finance). Majority (> 85% for most) have agreed to different parameters presented to them. These parameters include Aircraft weight variables, size and dimensions, engine type and manufacturers, performance ranges and speed variables.

For example, one needs to answer questions with regards to operational and environmental requirements such as:

- In what environment do I operate the aircraft (Hot/Cold)? Then, should I equip it with anti-icing or not? Do I need weather radar or not?
- Is the airfield short/long? Asphalt/gravel? Facilitated for IFR/ ILS/VFR?
- Where is my operating base? And how much weight can the destination airfield carry?
- What do I carry with the aircraft –(Passenger/Cargo/Both)? Then, what should the size and dimensions of the doors be? How should I configure the seats (Business/ Economy classes)?
- Do I need multi-engine/single-engine aircraft for my mission? What type of engine (turbo-prop/jet engine) should I choose? Which engine manufacturer should I get it from (Rolls Royce (RR), Pratt and Whitney (PWC), Thielert and Austro etc...)?
- What should be its speed and endurance? What about the fuel type and consumption (Jet-A, AVGASS) etc....

Accordingly, the outcome of this study has implied the significance of comprehensive observation for technical aspects of the aircraft to be acquired when all the respondents agree to the technical parameters presented to them.

Another area that was assessed in this study was relating to Maintenance, Repair and Overhaul (MRO), Service Support centers and certified spare part vendors. Respondents were asked if the proximity of MRO facilities, responsiveness of service support centers and sufficient number of

certified spare part vendors be considered as a selection criteria for an aircraft acquisition. To which 94.4% of the respondent believes that the responsiveness of service centers should be considered as a selection criteria for an aircraft acquisition. Proximity, after all, has many advantages for both the manufacturer and aircraft owner. First and foremost, having a repair service in close proximity means repairs can be completed faster and the maximum possible uptime maintained. Proximity also means faster service and reductions in shipping costs. Today, most airlines need replacement parts quickly due to the busy nature of their operation. That is why, exactly same amount of the respondents (94.4%) agreed that the number of certified spare part vendors also be considered for selection criteria in aircraft acquisition. According to (Biseul, 2008), responsiveness starts with the move to paperless processes that help service companies save time and increase productivity. With computerized processes, customers receive text messages or emails that provide updates about the progress of their request from the time they make the initial service request through to the technician's final report from the field (Paraxedo, 2008).

The global deficiency of airline pilots is reducing the quality of flights on offer. According to Boeing, the industry will need almost 800,000 new pilots by 2037 just to meet the increasing demand. This is around double that of the current Aviation personnel, and with air travel expected to double over the next twenty years (ICAO, 2007), how airlines keep up with this demand without enough pilots is another concern. According to Adam Coath (an aviation correspondent), the pilot shortage is due to lower ticket costs and higher oil prices meaning less money for highly trained pilots. Beyond that, there are other obstacles to admission for young pilots. They now are required to train for hundreds of hours in flight simulators, which, even as making Aviation safer, rack up prohibitive costs during their training (Aerospace & Aviation Magazine, 2018).

In this study it was also observed that more than half of the respondents (67.2%) believed that there are no sufficient aviation training institutes that offer 'type rated' training for crew (flight and technicians) in Ethiopia while 29.4% believed that the existing institutes to be sufficient. There is deficient in aviation training facilities in the country to feed the required skilled man power in to the sector meaning that air operators are lead to reconsider their interest in a

particular aircraft only for its requirement of skilled manpower. Thus, they are made to consider the requirements of skilled manpower as a selection criterion for an aircraft acquisition.

Coath also notes that some airlines are planning to branch out into pilot training to address the pilot shortage. According to his review, Qantas is planning to invest \$15 million into a pilot school, and Emirates has already opened a \$135 million flight academy to train the next generation of pilots. Some larger airlines are looking to lower their planes to just one pilot, or even remove them entirely. Currently most planes are required to have at least two pilots, but as airlines are struggling to meet that number, it will likely be lowered to just one in the coming years (Aerospace & Aviation Magazine, 2018).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

In this chapter, the summary of the major findings, conclusions and recommendations are presented. The summary briefly discusses the study and sums up the findings of the study which is followed by conclusions drawn out from the findings and finally, recommendations that the researcher believed to be helpful to different stakeholders are presented.

5.2. Summary of Findings

Looking at the demographic characteristics of respondents, out of the 180 respondents 160 were male which is 88.9% of the total respondents while the numbers of female respondents were 20 which accounted for 11.1% of the total respondents. As the study was targeting senior employees who are working at managerial and supervisory level, 55.6% of the respondents were 60 years old and above while 33.3% of the respondents were aged between 30 - 39 years old. Respondents, whose age range falling between 40 and 60, account only for 5.6%. Regarding the experience of the respondents, 61.1% of the total population has more than 25 years of experience while 16.7% had 15 and more years of experience. Looking at respondents' functional area/division, Engineering/MRO was 23.2%, Crew Training (aviation academy) accounted for 15.2% and Flight operations and Quality assurance occupied with 12.8% and 12.3% respectively while both Finance and Safety account 9.4% each, the rest participated in the study were from legal service (6.6%), Marketing/Commercial (6.2%), Administration (3.3%) and 2.4% were from other departments. When it comes to the ownership of the respondents' organization 22.2% were from private company while the rest 77.8% are working in governmental organization. This brings the total to a 100% meaning, there were no any from NGO/Missionary and other form of air operators.

Looking at the statistical analysis, aircraft financing, operational & environmental requirement as well as national and international regulatory requirement was ranked the top three as most relevant for an aircraft acquisition. Majority of the respondents are familiar with acquisitions by lease (35%), self-financing (23%), commercial banks (19%), and financing of acquisition by airframe/engine manufacturers (13%). However, Insurance, Private equity & hedge funds are not so common in Ethiopian aviation sector. Furthermore, majority of the respondents (83.3%) disagree to the statement that claims that 'there are sufficient financial sources in Ethiopia to

finance aircraft acquisition projects'. While 72.2 % of the respondents disagrees to the statement that reads 'there are provisions/frameworks and/or guidelines designed by financial institutes to finance aircraft acquisitions in Ethiopia'. Similarly same amount of respondents believe that financial institutes in Ethiopia are not willing and comfortable to avail finances for aircraft acquisition.

Moving on to the results of legal services and consultancies in the country, 72.2% of the respondents disagree that 'there are adequate number of lawyers specializing in aircraft acquisition (aviation lawyers) in Ethiopia. While only 11.1% of the respondents think otherwise. This leaves the remaining 16.7% who have a neutral opinion on the matter. Furthermore, 22.2% of the respondents strongly disagree to the statement: 'There are adequate lawfirms that advise/consult legal and agreement matters for aircraft acquisition projects in Ethiopia' while another 50% disagree putting the total respondent who disagreed to the statement at 72.22%.

Comes next is to Maintenance, Repair and Overhaul (MRO), Service Support centers and certified spare part vendors. Respondents were asked if the proximity of MRO facilities, responsiveness of service support centers and sufficient number of certified spare part vendors be considered as a selection criteria for an aircraft acquisition. More than three fourth of the respondents (88.9%) have that the proximity of MRO facilities should be considered as a selection criteria while only 5.6% of the respondents have indifferent opinion. Similarly, 94.4% of the respondent believes that the responsiveness of service centers should be considered as a selection criteria for an aircraft acquisition. Exactly same amount of the respondents (94.4%) agree that the number of certified spare part vendors also be considered for selection criteria in aircraft acquisition.

With regard to the national and international regulatory requirements, majority of the respondents 54.4% strongly agree to the statement that checks whether or not 'ECAA works closely with air operators to assist in aircraft acquisition' while 22.8% also slightly agree to the statement. Looking at to the 'age restriction on acquisition of aircraft stated under ECARAS, 75% of the respondents believes that the restriction is correct and beneficial while 16.1% have neutral opinion. Despite these similarities in response, respondents had divided opinion with regards to 'the restriction on the number of seats on private operator's aircraft' i.e. while 47.8% agreed to the statement, very close number amounting 33.9% have disagreed.

Another area assessed was relating to crew training, results show that 67.2% of the respondents believe that there are no sufficient aviation training institutes that offers 'type rated' training for crew (flight and technicians) in Ethiopia. And 64.4% of the respondents believe that their company considers the training requirements among selection criteria for an aircraft acquisition while 16.7% have neutral opinion on the matter.

Respondents were also presented with statements containing different variables such as aircraft size, dimension, weight, speed, performance range, as well as engine type and manufacturer to which more than 85% have agreed to all parameters presented to them saying all must be considered and critically observed for aircraft acquisition. The results obtained through quantitative analysis were also backed up with the qualitative analysis giving detailed insight on the matter further illustrating the practices and challenges of aircraft acquisition in Ethiopian aviation sector.

Finally, Core findings of the interviews and qualitative analysis also show that:

- Financing of aircraft acquisition requires huge capital and the only financial institutions in the country to avail loans are commercial banks.
- Financial Institutes in the country do not have clear understanding and prior experience about the sector. As a result, are unwilling to undertaking in such projects.
- There exists shortage in foreign currency as all transactions in relation to aircraft acquisition are taking place through USD/Euro currencies.
- Foreign investors are not allowed to invest in the sector as it is reserved only for Ethiopian nationals.
- Another major cost associated with owning and operating an aircraft is the cost for Insurance. The capability of Insurance companies in the country is limited Hence are required to look out to insurance market in Europe and Middle East.
- Private air operators are allowed to operate a maximum seat capacity of 50 which limited these operators to unscheduled and air charter operations only.
- There are insufficient number of aviation lawyers and that of aviation consultation firms in the country.
- There exists lack of prior adequate planning and evaluation in the parts of the air operators with regards to aircraft acquisition.

- It is crucial to consider the proximity of maintenance facilities as well as service support centers and certified spare part vendors before embarking on aircraft acquisition projects.
- The requirement for a well trained workforce is another headache for airlines that is associated with aircraft acquisition in that, there are not sufficient aviation schools in the country and movement of professionals for a better wage has made their thriving in the sector even more difficult.

5.3. Conclusions

The main objective of this study was to assess the practices and challenges of aircraft acquisition projects in the context of Ethiopia. To that end, several aspects of the study subject were assessed. The assessment areas include, aircraft financing, the role of regulatory body, the closeness and importance of MROs, the responsiveness of service support centers, availability of certified spare part vendors, the role and importance of crew training as well as, legal consultations and other aircraft technical parameters by doing so, to draw lessons and offer suggestions on the areas of improvement. The findings of this study showed that, leasing and self-financing are the most common form of aircraft financing in Ethiopia followed by debt financing from commercial banks therefore, insurance and other form of financing are not common. Moreover, Analysis results show that there are no sufficient financial sources in the country to finance aircraft acquisitions. It is also discovered through the study that existing financial institutes are less willing to finance aircraft acquisitions and they do not have provisions specially tailored for aircraft acquisitions. From this, we can conclude that financing is one area of challenge in aircraft acquisitions that requires improvement. Another area this study explored was the aspect of legal services and legal consultations in the country. The findings indicate that, there are no adequate number of aviation lawyers and legal advisor in the country that consults in aircraft acquisition. It also indicates that there are not so many lawyers who are specializing in aviation. Hence, we can conclude that finding legal service that consults in aircraft acquisition is also another area of challenge in aircraft acquisition taking place in the country. Moving on to the Maintenance, Repair and Overhaul (MRO), Service Support centers and spare part vendors, findings show that it is very important to consider the proximity of MROs, the responsiveness of service support centers and the availability of certified spare part vendors before embarking on aircraft

acquisition. Although ECAA, as a regulatory body assists in aircraft acquisitions, there exist restrictions on the age and number of seats for aircraft that private air operators are allowed to own and operate. This shows the double standard in treatment of private and government air operators.

Crew training was another area that this study has explored. With this, results illustrate that although most air operators consider the training requirements among selection criteria, there were no sufficient aviation training institutes that offers 'type rated' training for crew (flight and technicians) in Ethiopia therefore, making the practice even more exigent. The technicalities containing different variables such as the aircraft size and dimension, weight, speed, performance range, as well as engine type and manufacturer must also be considered and critically observed for aircraft acquisition. Consequently, we can say that, the results obtained through quantitative analysis aligned and had been backed with the qualitative analysis giving detailed insight on the matter further illustrating the practices and challenges of aircraft acquisition in Ethiopian aviation sector.

Generally, this study have covered some unique set of activities that are required to be followed and other set of rules and standards stated under the ECARAS that one must adhere to own and operate an aircraft in Ethiopia. The activities include finding source of financing and obtaining an air operator certificate (AOC) which consists of processes namely Pre-application, Formal Application, Document Evaluation, Demonstration and Inspection, and Certification. Additionally, airliners are expected to go through careful analysis of their operational, environmental, technical, legal and regulatory requirements as well as the requirements stipulated under their purchase and/or lease agreement. The practice in Ethiopia is also characterized by several challenges such as lack of financing, the lack of understanding and provision of financial institutes, shortage of foreign currency, the cost requirements to own and operate an aircraft, some restrictions by regulatory body, the lack of legal professionals and consultations in the sector, as well as the inadequacy of training facilities. These challenges are originating from government policies, regulatory body restrictions, financial institutes and the airlines themselves.

5.4. Recommendations

The findings of this study show that acquiring aircraft in Ethiopia has multi-dimensional challenges that instigate from different stakeholders of the sector. These entities include governments' policy, regulatory restrictions, financial environment of the country, legal and professional as well as other service providers. Reviewing and evaluation of technical aspects of the aircraft to be acquired is a headache on its own. Unless all actors come together to alleviate the underlying challenges, it would be difficult for the sector to flourish and make significant impact in the countries' economy. Therefore, the following are some recommendations that need to be looked at by their respective organizations for success of such projects and for the sector to reach its full potential:

Recommendation to the Government of Ethiopia

- As the study shows the role of government to be vital, government should give enough attention to the sector by engaging with private and government air operators in policy making. This would help address the needs of all actors in the sector. It can start by allowing the regulatory body autonomy by establishing it independently rather than working under the Ministry of Transport.
- Government should not be deceived by the success of EAL and has to dissolve the sole control and ownership of Ethiopian aerodromes and form an independent organization (like former Ethiopian Airport Enterprise) that equally serves the interest of both private and government air operators.
- Government should understand the potential of the sector and ease up the foreign currency regulation imposed by the 'National Bank of Ethiopia' through affirmative action for some selected sectors such as the aviation.
- Government should revisit its policy and encourage foreign investors to involve in the sector by liberalizing it and allowing joint-venture. This would promote FDI and foreign currency generation. This could also help bring the experience of other developed nations in the country and aid in knowledge transfer. It can also promote healthy competition to the existing air operators.

Recommendations to the Regulatory body (ECAA)

- According to the study results, the support of regulatory body was found imperative for the success of aircraft acquisition hence; regulatory body should closely work and support the air operators in their pursuit of aircraft acquisition.
- Similarly, ECAA should hold regular meetings with the stakeholders to discuss the challenges they are facing in an attempt to improve their role in aircraft acquisition.
- ECAA should revise and improve the restriction imposed on the number of seats that private operators could operate. This would open doors to lots of opportunities for air operators to acquire larger aircraft and serve the flying needs of their customers. Furthermore, it would allow them to expand their business and create more job opportunities to the youth. ECAA instead should focus on compliancy and capacity building for private air operators.
- ECAA should take best practices from other countries and integrate them to Ethiopian context to facilitate the sector. This could include initiation of revision on the Civil Aviation policy.
- It would be better if ECAA could collaborate and prepare to issue lands for the construction of aircraft maintenance hangar in collaboration with regional governments and city administrations. By doing so, ECAA not only avert the excess amount of foreign currency outflow, but also promote in generating in flow of foreign currency to the service rendered by AMOs. Such facilities will also be beneficial for knowledge transfer.

Recommendations to Financial Institutes

- Financial institutes should expose themselves more to the aviation sector and support air operators by availing loans with low interest rates for an aircraft acquisition.
- Financial institutes should train and hire aviation-finance specialists to best serve the financial needs of the sector.
- Financial institutes should establish a separate unit in their organization solely to serve the interest of aviation stakeholders.

Recommendations to Air Operators

- Air operators should systematically evaluate on each details of technicalities on aircraft acquisitions instead of purchasing/leasing aircraft only driven by operational requirements alone, they should involve experts of each area (financial, technical, operational, legal etc.....) before making decisions.
- As per the results of the study, operators should seriously take the proximity of MROs, responsiveness of support centers and availability of certified spare part vendors in to consideration. As this could have grave impact on their operation after acquiring the aircraft.
- Air operators should form unions to get themselves heard and should focus on their common interests instead of focusing only on their business rivalry. This can help them to direct their wishes and opinions on policies to the regulatory/government.
- Air operators should invest in establishing more aviation academies to train more professionals especially for those professions that require special expertise like aviation-financial advisors and legal consultations in aircraft acquisition. This diversification will present them with another opportunity for business not to mention solving their lack of professionals in legal and financial consultation.

Recommendation for Future Research

Building up on the findings of this study; future studies can address the effects of specific proceedings, advent of a new philosophy or evidence and/or other recent trends in aircraft acquisition against that of the Ethiopian practice. As this study was conducted with in the setting of specific context and location, future studies can also address same research problem in different setting such as time/period. It is wrathful to also involve non-senior and non-managerial employees as well as the contributories who drafted the 'Civil Aviation Proclamation'(PROCLAMATION NO. 616/2008) and finally, future studies can as well stretch-out to assess the practices and challenges of aircraft acquisition in Military Aviation.

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APPENDICES

APPENDIX I – QUESTIONNAIRE



St. Mary's University School of Graduate Studies Questionnaire

Dear respondent,

Thank you for volunteering to fill out this questionnaire, the objective of which is to capture essential information for the study entitled *“Practices and Challenges of New Aircraft Acquisition Projects: the case of Ethiopian Aviation Sector”*. Your kind assistance to provide timely, relevant and quality data will have paramount importance for the completion of the study. Hence, I would like to sincerely request you to carefully answer each question.

The first part of this questionnaire seeks to collect demographic information while the second focuses on capturing general information relating to the study subject. The third part is concerned with technical questions about aircraft acquisition.

The information you provide through this questionnaire will be utilized for scientific analysis and academic purposes for the partial fulfillment of the requirements for Master of Arts in Project Management. Your identity will not be disclosed and the confidentiality of your response will remain classified. Thank you in advance for your willingness and your assistance.

Respectfully!

PART I - GENERAL DEMOGRAPHIC DETAILS

Dear respondent,

After reading the statements listed below, please answer each question in the following section by placing a or mark where you deem is appropriate.

1. Please indicate your **age**.

18-29 30-39 40-49 50-59 >=60

2. Please indicate your **gender**.

Male Female

3. Please indicate your **experience in the aviation sector**.

>5 Years >10 Years >15 Years >20 Years >25 Years

4. Please indicate the **ownership** of your organization.

Private Government NGO/Missionary Other _____

5. Please indicate the **core business** which best describes your organization (you can select more than one).

<input type="checkbox"/>	Scheduled Flight	<input type="checkbox"/>	Medical Evacuation/Air Ambulance
<input type="checkbox"/>	Unscheduled Flight	<input type="checkbox"/>	Aerial Application
<input type="checkbox"/>	Air charter (Passenger & Cargo)	<input type="checkbox"/>	Aerial Survey, photography, Filming
<input type="checkbox"/>	International Flight	<input type="checkbox"/>	Special Services, Company Operator
<input type="checkbox"/>	Domestic Flight	<input type="checkbox"/>	Helicopter Operator

If other please specify _____

6. Please indicate the number of aircraft your company owns/operates

1-5 6-10 10-15 16-20 >21

7. Please indicate the **functional area** which defines your position **within your organization**.

Flight Operations Engineering/MRO Finance
 Marketing/Commercial Crew Training Other _____
 Safety Legal service
 Quality Administration

PART II – GENERAL QUESTIONS ABOUT AIRCRAFT ACQUISITION PRACTICES IN ETHIOPIA

This part of the questionnaire seeks to collect information directly relating to the study subject. In the next sections, you will be asked to rank, choose or place a or marks on five point scale alternatively where you deem is appropriate. Please respond to each question carefully.

1. Please **Rank the following (1 – 7)** based on how important you think they are to be considered for an aircraft acquisition. (i.e. Rank them from the most important = 1 to the least important = 7)

No.	Item	Rank
1.	Aircraft Financing	
2.	Operational/Environmental Requirements	
3.	Regional/Global Airline Market conditions	
4.	Technical Specification and Performance	
5.	International and National Regulatory Requirements	
6.	Skilled Manpower (Flight and Maintenance Crew Training)	
7.	Maintenance, Repair, Overhaul (MRO) Service Support Facilities and Certified Spare part Vendors	

2. What mode of Aircraft financing have you utilized for previous aircraft acquisitions? You may choose more than one.

- | | | |
|--|---|--|
| <input type="checkbox"/> Self-financing | <input type="checkbox"/> Export Credit Agency | <input type="checkbox"/> Tax Equity |
| <input type="checkbox"/> Leasing (Dry/Wet) | <input type="checkbox"/> Private Equity & Hedge Funds | <input type="checkbox"/> Insurance |
| <input type="checkbox"/> Capital Market | <input type="checkbox"/> Commercial Banks | <input type="checkbox"/> Airframe/Engine Manufacturers |
| | <input type="checkbox"/> Other, Specify _____ | |

3. In your opinion, the **5 most important ‘key drivers of change’** for regional & global airline market conditions are (tick only 5):

- | | | |
|---|--|---|
| <input type="checkbox"/> Geopolitics | <input type="checkbox"/> Economy | <input type="checkbox"/> Values and communities |
| <input type="checkbox"/> Security & borders | <input type="checkbox"/> Data, Privacy & Trust | <input type="checkbox"/> Government |
| <input type="checkbox"/> Environment | <input type="checkbox"/> Technology | <input type="checkbox"/> Business Model |

Listed below are statements that relate to the current aircraft acquisition practices in Ethiopia. After reading the statements, rate them per your opinion to indicate if you strongly agree, mildly agree, have neutral opinion, disagree or strongly disagree to the statement by placing a or .

	No.	Question	Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)
Aircraft Financing	Q4.	There are sufficient financial sources in Ethiopia to finance an aircraft acquisition project.	1	2	3	4	5
	Q5.	There are provisions/frameworks and/or guidelines designed by financial institutes to finance aircraft acquisitions projects in Ethiopia.	1	2	3	4	5
	Q6.	Existing financial institutes in Ethiopia are willing and comfortable to avail finances for aircraft acquisitions projects.	1	2	3	4	5
Legal Services/Law Firms	Q7.	There is adequate number of lawyers specializing in aircraft acquisition (aviation lawyers) in Ethiopia.	1	2	3	4	5
	Q8.	There are adequate law firms that advise/consult legal and agreement matters for aircraft acquisition projects in Ethiopia.	1	2	3	4	5
MRO, Service Support Centers, Certified Spare part Vendors	Q9.	The proximity of MRO facilities should be among selection criteria for an aircraft acquisition.	1	2	3	4	5
	Q10.	The responsiveness of service support centers should be considered as a selection criteria for an aircraft acquisition.	1	2	3	4	5
	Q11.	The number of certified spare part vendors should be considered as a selection criteria for an aircraft acquisition.	1	2	3	4	5

	No.	Question	Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)
National and International Regulatory Requirements	Q12	The regulatory body (ECAA) works closely with air operators to assist in aircraft acquisition.	1	2	3	4	5
	Q13	The aircraft age restriction on acquisition of aircraft stated on ECARAS is correct.	1	2	3	4	5
	Q14	The restriction on the number of seatson private operators' aircraftstated under ECARAS is fair.	1	2	3	4	5
Skilled Manpower (Crew Training)	Q15	There are sufficient aviation training institutions that offer type rating trainings for crew (flight and Technicians) in Ethiopia.	1	2	3	4	5
	Q16	My company considers the training requirements among the criteria before an aircraft acquisition.	1	2	3	4	5

PART III - TECHNICAL QUESTIONS ABOUT AIRCRAFT ACQUISITION IN ETHIOPIA

This part of the questionnaire seeks to collect information relating to technical considerations for aircraft acquisition. You are asked to place or mark on five point scale where you deem it appropriate. Please answer each question carefully.

Q1. The following SIZE AND DIMENSION aspects must be considered during selection of aircraft for acquisition.						
	SIZE AND DIMENSION	Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)
	- Cabin Height	1	2	3	4	5
	- Cabin Width	1	2	3	4	5
	- Cabin Length	1	2	3	4	5
	- Cabin Volume	1	2	3	4	5
	- Cabin Door	1	2	3	4	5
	- Internal Baggage Volume	1	2	3	4	5
	- External Baggage Volume	1	2	3	4	5
	- Crew & Executive Seats	1	2	3	4	5
	- Passenger Seats	1	2	3	4	5

Q2. The following SPEED VARIABLES must be considered during selection of aircraft for acquisition.						
	SPEED	Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)
	- Maximum Cruising Speed	1	2	3	4	5
	- Minimum Cruising Speed	1	2	3	4	5
	- Normal Cruising Speed	1	2	3	4	5
	- Long Range Speed	1	2	3	4	5

Q3.	The following AIRCRAFT WEIGHT DETAILS must be considered during selection of aircraft for acquisition.					
	AIRCRAFT WEIGHT	Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)
	- Maximum Takeoff Weight	1	2	3	4	5
	- Basic Operating Weight	1	2	3	4	5
	- Usable Fuel	1	2	3	4	5
	- Payload with full fuel	1	2	3	4	5
	- Maximum payload	1	2	3	4	5
Q4.	The following ENGINE TYPE AND MANUFACTURER details must be considered during selection of aircraft for acquisition.					
	ENGINE TYPE AND MANUFACTURER	Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)
	- Number of Engines	1	2	3	4	5
	- Model of Engine	1	2	3	4	5
	- Manufacturer of Engine	1	2	3	4	5
Q5.	The following PERFORMANCE RANGE details must be considered during selection of aircraft for acquisition.					
	PERFORMANCE RANGE	Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)
	- Range	1	2	3	4	5
	- Ferry Range	1	2	3	4	5
	- VFR Range	1	2	3	4	5
	- Balanced Field Length (BFL)	1	2	3	4	5
	- Landing Distance (Factored)	1	2	3	4	5
	- Rate of Climb (Ft/min)	1	2	3	4	5

Q6. Are there any challenges for aircraft acquisition in Ethiopia?

YES NO

If Yes what are they? _____

Q7. How do you evaluate the government policy framework and Regulatory requirements with regard to aircraft acquisition?

Q8. How do you evaluate Ethiopian financial institutes' willingness and capabilities to finance aircraft acquisition? What need to improve with regard to financing?

Q9. What do you suggest/recommend with regards to aircraft acquisition in Ethiopia?

Q10. What can you say about the Ethiopian legal firms who support and consult through agreements for aircraft acquisitions in Ethiopia?

Is there anything further you would like to add?

Thank you for taking the time to complete this survey.
Your cooperation is greatly appreciated.

Would appreciate you returning this questionnaire to AshenafiTsegaye: +251-913-30-48-88, or
via email through: usher20@gmail.com

Appendix II - INTERVIEW CHECKLIST (REGULATORY)



St. Mary's University School of Graduate Studies

Semi-Structured Interview Checklist For the Regulatory Body (ECAA)

Thank you for volunteering for this scheduled interview the objective of which is to capture essential information for the study entitled *“Practices and Challenges of New Aircraft Acquisition Projects: the case of Ethiopian Aviation Sector”*. Your kind assistance to provide timely, relevant and quality data will have paramount importance for the completion of the study. Hence, I would like to sincerely request you to carefully answer each question raised.

The information you provide through this interview will be utilized for scientific analysis and academic purposes for my study in partial fulfillment of the requirements for the Degree of Master of Arts in Project Management. Keen effort will be made to keep your identity and confidentiality of your response to remain classified.

Thank you very much once again for your time and for providing me with useful information

1. How do you evaluate the overall performance of the aviation sector in Ethiopia?
2. What is the roll ECAA plays in aircraft acquisition?
3. Can you describe some of the international conventions that are taken into consideration for an aircraft acquisition?
4. What are the requirements of the regulatory body that operators must fulfill to acquire a new aircraft?
5. Are there any documents, checklists, and acquisition manuals etc... that guide an aircraft acquisition?
6. How do you evaluate the practice of aircraft acquisitions in Ethiopia?
7. How do you support aircraft acquisition projects?
8. In what area is the regulatory working to improve the process of acquisition?

9. What challenges do you think operators face with regard to aircraft acquisition in Ethiopia?

10. Do you have any suggestion or recommendation with respect to aircraft acquisition?

APPENDIX III – INTERVIEW CHECKLIST (OPERATORS)



St. Mary's University School of Graduate Studies

Semi-Structured Interview Checklist

For the Air Operators

Thank you for volunteering for this scheduled interview the objective of which is to capture essential information for the study entitled *“Practices and Challenges of New Aircraft Acquisition Projects: the case of Ethiopian Aviation Sector”*. Your kind assistance to provide timely, relevant and quality data will have paramount importance for the completion of the study. Hence, I would like to sincerely request you to carefully answer each question posed.

The information you provide through this interview will be utilized for scientific analysis and academic purposes for my study in partial fulfillment of the requirements for the Degree of Master of Arts in Project Management. Keen effort will be made to keep your identity and confidentiality of your response to remain classified.

Thank you very much once again for your time and for providing me with useful information

1. Can you tell me about the background, establishment and experience of your organization? What kinds of air services do you provide? And where do you operate (location)?
2. How many aircrafts do you operate and what types are they? How many among them do you own?
3. What position do you hold in your organization?
4. How many employees are there in the company? And how many among those involve in aircraft acquisition?

5. When was the last time (most recent) aircraft acquisition done for your company?
6. How do you acquire a new aircraft in to your fleet?
7. Is there any sort of planning practiced in your organization to acquire a new aircraft? Can you explain in detail what kinds of activities you carry out to acquire a new aircraft?
8. What makes or breaks aircraft acquisition negotiations for you? What are the most critical criteria you consider when acquiring an aircraft? (I.e. Technical, Financial or Operational, etc...)?
9. What modes of acquisitions exist and which one suits your need for most of the acquisitions you made so far? And why?
10. What can you tell me about your experience with regard to the requirements (policy, rules and standards) set by the regulatory body (ECAA) with respect of aircraft acquisition?
11. Are there any challenges in aircraft acquisition for Ethiopian operators? What are they?
12. How helpful are the government policies & standards with respect to aircraft acquisitions?
13. How do you secure finances for your acquisition of aircraft?
14. How do you evaluate Ethiopian financial institutes' willingness and capabilities to finance aircraft acquisition? What need to improve with regard to finances?
15. What do you suggest to be done by each stakeholder (Government, regulatory, operators, finance companies etc...) to improve/ to make aircraft acquisition less challenging?
16. What suggestions do you have for those who embark on such projects in the future?

APPENDIX - IV RELIABILITY TEST RESULTS

Case Processing Summary

		N	%
Cases	Valid	180	100.0
	Excluded ^a	0	.0
	Total	180	100.0

a. Listwise deletion based on all variables in the procedure.

AIRCRAFT FINANCING

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.894	.895	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
There are sufficient financial sources in Ethiopia to finance an aircraft acquisition project.	7.50	3.380	.862	.791	.786
There are provisions/frameworks and/or guidelines designed by financial institutes to finance aircraft acquisitions projects in Ethiopia.	7.72	3.107	.862	.793	.791
Existing financial institutes in Ethiopia are willing and comfortable to avail finances for aircraft acquisitions projects.	7.78	4.531	.689	.475	.937

LEGAL SERVICES AND FIRMS

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.748	.749	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
There is adequate number of lawyers specializing in aircraft acquisition (aviation lawyers) in Ethiopia.	3.78	1.068	.599	.359	.
There are adequate law firms that advise/consult legal and agreement matters for aircraft acquisition projects in Ethiopia.	3.94	.947	.599	.359	.

MRO, SERVICE SUPPORT CENTERS AND CERTIFIED SPARE PART VENDORS

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.892	.912	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
The proximity of MRO facilities should be among selection criteria for an aircraft acquisition.	3.17	1.704	.780	.704	.903
The responsiveness of service support centers should be considered as a selection criteria for an aircraft acquisition.	3.39	2.027	.918	.856	.735
The number of certified spare part vendors should be considered as a selection criteria for an aircraft acquisition.	3.44	2.706	.767	.727	.894

NATIONAL AND INTERNATIONAL REGULATORY REQUIREMENTS

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.715	.725	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
The regulatory body (ECAA) works closely with air operators to assist in aircraft acquisition.	4.94	2.604	.526	.377	.641
The aircraft age restriction on acquisition of aircraft stated on ECARAS Part IV is correct.	4.63	2.809	.675	.466	.478
The restriction on the number of seats on private operators' aircraft stated under ECARAS Part IV is fair.	3.94	3.002	.431	.228	.751

TECHNICAL AND OPERATIONAL AIRCRAFT LIMITATIONS

AIRCRAFT WEIGHT

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
1.000	1.000	5

Inter-Item Correlation Matrix

	Maximum Takeoff Weight	Basic Operating Weight	Usable Fuel	Payload with Full Fuel	Maximum Payload
Maximum Takeoff Weight	1.000	1.000	1.000	1.000	1.000
Basic Operating Weight	1.000	1.000	1.000	1.000	1.000
Usable Fuel	1.000	1.000	1.000	1.000	1.000
Payload with Full Fuel	1.000	1.000	1.000	1.000	1.000
Maximum Payload	1.000	1.000	1.000	1.000	1.000

ENGINE TYPE AND MANUFACTURER

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.908	.912	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Number of Engines	3.17	1.369	.714	.558	.961
Model of Engines	3.28	1.319	.910	.888	.791
Manufacturer of Engines	3.22	1.403	.841	.859	.850

SPEED VARIABLES (Performance Range)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.952	.955	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Max_Cruising_Speed	5.81	5.185	.943	.943	.919
Min_Cruising_Speed	5.63	5.142	.917	.851	.929
Normal_Cruising_Speed	5.94	6.851	.786	.640	.971
Long_Range_Speed	5.88	5.393	.937	.932	.921

SKILLED MANPOWER (FLIGHT AND MAINTENANCE CREW TRAINING)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.734	.739	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
My company considers the training requirements among the criteria before an aircraft acquisition.	3.40	1.314	.586	.343	.
There are sufficient aviation training institutions that offer type rating trainings for crew (flight and Technicians) in Ethiopia.	2.49	.978	.586	.343	.

APPENDIX - V NORMALITY TEST RESULTS

AIRCRAFT FINANCING

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
There are sufficient financial sources in Ethiopia to finance an aircraft acquisition project.	180	1	5	4.00	1.057	-1.435	.181	1.762	.360
There are provisions/frameworks and/or guidelines designed by financial institutes to finance aircraft acquisitions projects in Ethiopia.	180	1	5	3.78	1.136	-.939	.181	.117	.360
Existing financial institutes in Ethiopia are willing and comfortable to avail finances for aircraft acquisitions projects.	180	1	5	3.72	.872	-1.472	.181	3.084	.360
Valid N (listwise)	180								

LEGAL SERVICES AND FIRMS

Descriptive Statistics

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
There is adequate number of lawyers specializing in aircraft acquisition (aviation lawyers) in Ethiopia.	180	3.94	.973	.947	-.624	.181	-.574	.360
There are adequate law firms that advise/consult legal and agreement matters for aircraft acquisition projects in Ethiopia.	180	3.78	1.033	1.068	-1.079	.181	.982	.360
Valid N (listwise)	180							

MRO, SERVICE SUPPORT CENTERS AND CERTIFIED SPARE PART VENDORS

Descriptive Statistics

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
The proximity of MRO facilities should be among selection criteria for an aircraft acquisition.	180	1.83	.960	.922	1.872	.181	4.142	.360
The responsiveness of service support centers should be considered as a selection criteria for an aircraft acquisition.	180	1.61	.758	.574	1.565	.181	2.908	.360
The number of certified spare part vendors should be considered as a selection criteria for an aircraft acquisition.	180	1.56	.600	.360	.568	.181	-.590	.360
Valid N (listwise)	180							

TECHNICAL AND OPERATIONAL AIRCRAFT LIMITATIONS

AIRCRAFT WEIGHT

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Maximum Takeoff Weight	180	1	3	1.44	.600	1.001	.181	.005	.360
Basic Operating Weight	180	1	3	1.44	.600	1.001	.181	.005	.360
Usable Fuel	180	1	3	1.44	.600	1.001	.181	.005	.360
Payload with Full Fuel	180	1	3	1.44	.600	1.001	.181	.005	.360
Maximum Payload	180	1	3	1.44	.600	1.001	.181	.005	.360
Valid N (listwise)	180								

SIZE AND DIMENSION

Descriptive Statistics

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Cabin_Height	180	1.67	.669	.447	.504	.181	-.737	.360
Cabin_Width	180	1.67	.669	.447	.504	.181	-.737	.360
Cabin_Length	180	1.78	.713	.509	.353	.181	-.983	.360
Cabin_Volume	180	1.72	.652	.425	.352	.181	-.722	.360
Cabin_Door	170	1.71	.667	.446	.418	.186	-.766	.370
Internal Baggage Volume	180	1.67	.579	.335	.194	.181	-.651	.360
External Baggage Volume	180	2.00	.819	.670	.618	.181	.034	.360
Crew and Executive Seats	180	1.72	.652	.425	.352	.181	-.722	.360
Passenger Seats	180	1.61	.592	.351	.376	.181	-.683	.360
Valid N (listwise)	170							

ENGINE TYPE AND MANUFACTURER

Descriptive Statistics

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Number of Engines	180	1.67	.669	.447	.504	.181	-.737	.360
Model of Engines	180	1.56	.600	.360	.568	.181	-.590	.360
Manufacturer of Engines	180	1.61	.592	.351	.376	.181	-.683	.360
Valid N (listwise)	180							

SPEED VARIABLES (Performance Range)

Descriptive Statistics

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Max_Cruising_Speed	180	1.83	.900	.810	.801	.181	-.281	.360
Min_Cruising_Speed	170	2.06	.940	.884	.314	.186	-1.041	.370
Normal_Cruising_Speed	180	1.72	.652	.425	.352	.181	-.722	.360
Long_Range_Speed	160	1.88	.860	.739	.846	.192	.185	.381
Valid N (listwise)	160							

SKILLED MAN POWER (FLIGHT AND MAINTENANCE CREW TRAINING)

Descriptive Statistics

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Max_Cruising_Speed	180	1.83	.900	.810	.801	.181	-.281	.360
Min_Cruising_Speed	170	2.06	.940	.884	.314	.186	-1.041	.370
Normal_Cruising_Speed	180	1.72	.652	.425	.352	.181	-.722	.360
Long_Range_Speed	160	1.88	.860	.739	.846	.192	.185	.381
Valid N (listwise)	160							

APPENDIX - VI

DECLARATION

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Misganaw Solomon (Phd.). All sources of materials used for the thesis have been dulyacknowledged. I further confirm that the thesis has not been submitted either in part or in full toany other higher learning institutions for the purpose of earning any degree.

AshenafiTsegaye

Name

St. Mary's University, Addis Ababa

Signature

June 2020

APPENDIX - VII
ENDORSEMENT

This thesis has been submitted to St. Mary's University, School of Graduate Studies, for examination with my approval as a university advisor.

Misganaw Solomon (Phd.)

Advisor
St. Mary's University, Addis Ababa

Signature
June 2020