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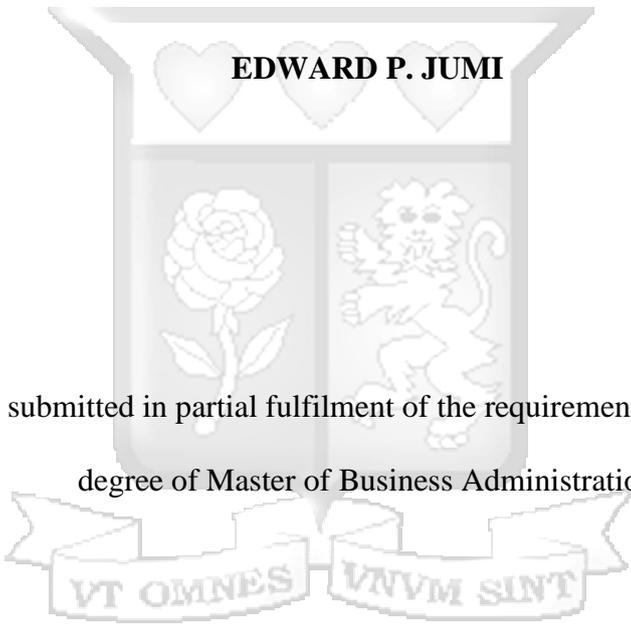
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**THE EFFECT OF CIVIL AVIATION REGULATIONS ON THE GROWTH
OF THE DOMESTIC AIRLINE INDUSTRY IN KENYA**



EDWARD P. JUMI

A dissertation submitted in partial fulfilment of the requirements for the award of the
degree of Master of Business Administration

Strathmore Business School

May 2019

DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other university. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the thesis itself.

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Edward Pitya Jumi
May 2019

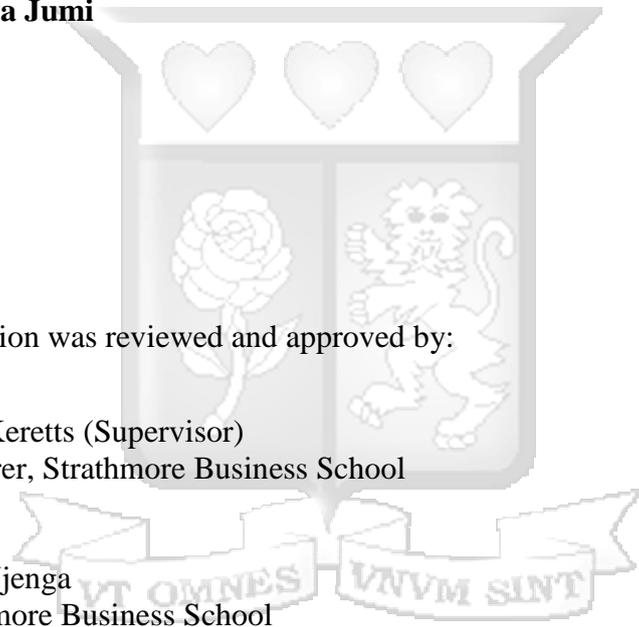
Approval

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ABSTRACT

The domestic airlines in Kenya have experienced considerable growth in the last few years despite increased competition from other regional and international carriers. With the current change in the regulatory framework the study sought to examine the effect of civil aviation regulations on the growth of the domestic airline industry. The study specifically examined the effect of operation of aircraft regulations, personnel licencing regulations, air operator and administration regulations as well as the RPAS regulations. The unit of analysis was the 67 domestic airline firms in Kenya. The unit of observation was the Chief Finance Officer or Operations Manager within each domestic airline firm. The research also employed the use of both primary and secondary data. The primary data was collected from a semi-structured questionnaire while secondary data was collected from aviation industry reports and journals. The collected research data was analyzed using descriptive, inferential and content analysis. The study employed means, standard deviation, correlation analysis and regression analysis. The results of the analysis were presented using bar graphs, charts, figures and tables. The findings of the regression analysis indicated that civil aviation regulations had a positive association with the growth of the domestic airline industry. The study concludes that meeting operation of aircraft regulations, personnel licencing regulations, air operator and administration requirements are key to fostering the growth of the domestic airline industry in Kenya. The research recommends that the aviation firms should invest in modern aircraft to reduce maintenance cost; enhance employee training and recruitment as well as expand their safety and aviation security measures. The findings of the study are expected to foster policy and practice within the domestic airline industry. The study suggests that further research should be conducted to examine the potential drivers for economic exploitation of drones in the country.



Keywords: *Civil regulations, operation of aircraft, personnel licencing, air operator certification and administration, RPAS regulations, domestic airline industry growth*

DEDICATION

I dedicate this research work to my wife and son for their moral support, encouragement and understanding during the long hours spent on it.



ACKNOWLEDGEMENTS

I am grateful to God for his blessings that have made my MBA journey at Strathmore Business School a success. I also wish to thank my supervisor Dr. Monica Keretts, who has been an ever-present support throughout this research project.



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ABBREVIATIONS AND ACRONYMS

AFDB	African Development Bank
AFI	Africa-Indian Ocean Region
CE	Critical Elements
GASP	Global Aviation Safety Plan
GDP	Gross Domestic Product
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
KAA	Kenya Airports Authority
KCAA	Kenya Civil Aviation Authority
KCAR	Kenya Civil Aviation Regulations
RPAS	Remotely Piloted Aircraft Systems
SSP	State Safety Program
SPSS	Statistical Package for Social Sciences
USOAP	Universal Safety Oversight Audit Programme



OPERATIONAL DEFINITION OF TERMS

Air operator and administration regulations	This refers to the regulations targeting air operator certification and administration requirements (KCAA, 2012).
Aviation Sector	This refers to the collection of various players within the aviation industry in Kenya, including the auxiliary firms supplying fuel, catering etc (Mhlanga, Steyn, & Spencer, 2018).
Growth	This refers to the amount of revenue generated, value added and expansion in the volume of business of domestic airlines or local companies involved in aviation (Saranga & Nagpal, 2016).
Operation of aircraft regulation	This outlines the regulations that will govern the operation of aircraft for commercial air transport (KCAA, 2012).
Personnel Licencing	This refers to the certification of personnel to undertake professional aviation services (Adediran, 2016).
RPAS regulations	These refer to the guidelines overseeing the licencing and operation of unmanned aerial vehicles or remotely piloted aircraft (KCAA, 2012).

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter presents the foundation for the research by expanding the available knowledge on the global, regional and local link between the civil aviation regulations and the growth of domestic airline industry. The purpose of the chapter was to provide a summary of the research by highlighting the background of the study variables, presenting the research problem as well as the highlighting the research questions that will enable the solving of the research problem. The chapter further presents the scope and the significance of the study.

1.2 Background of the Study

The Convention on International Civil Aviation better known as the Chicago Convention was borne out of an agreement between 54 states after the end of World War II. The convention's sole goals were to advance the formulation and development of systematic safety policies geared towards promoting the global civil aviation services through regulatory policies and guidelines. The proceedings of the convention led to the formation of International Civil Aviation Organization (ICAO), a United Nations specialized agency which now boasts 191 Contracting States (ICAO, 2006).

According to a report by the African Development Bank (ADfB, 2012) the growth of the aviation industry in Africa is by far low compared to European and American nations. However, the continent has seen an upsurge in passengers and flight traffic by 45% and 80% respectively. The airline industry is one of the most significant infrastructures in the world and its economic significance cannot be understated. This sector was responsible for transporting more than 1.657 billion passengers in 2013; -

this is equivalent to more than 25% of the population on earth and amounts to about 34.5 million tonnes of freight. The industry is also key in transporting export products and was responsible for almost 40% (by value) of the world's manufactured exports and 45% of the more than 714 million international tourists (Njoya., 2014). These numbers are expected to rise year by year, and the freight industry predicts that by 2014, the industry will be responsible for as much as 80% of the world's produce by value (RoK, 2012).

In China Shaw, Lu, Chen, and Zhou, (2009) indicated for the period 2006-2009 the domestic airline grew by 66.5% leading to an increase of 340 million domestic passenger traffic. Borenstein (2017) notes that deregulation of the US airline industry led to robust growth which generated an increase of 6.4% growth in profit with 3.9% increase in domestic passenger traffic. Hassan and Olabosinde, (2017) indicated that air operational facilities and operation management was critical for the growth of the domestic airline industry in Nigeria.

Locally, between 2005 and 2010, there was a 22.5% increase in passenger traffic, reaching a 7.2 million high. Of these, 2.3 million were domestic users, 3.7 million international clients while 1.2 million were transiting passengers. In 2012, this number had risen to 8.5 million. However, the total freight handled stood at 305,986 tonnes in 2011 but declined to 296,395 tonnes in 2012 (KCAA, 2012).

According to Oxford Economics (2011) the aviation sector contributed to 1.1% of the GDP. This was reflected in the direct contribution of KES 13billion and 46,000 employment opportunities within the sector. KAA (2018) indicated that the number of aircraft movements into and out of Kenyan airports grew from 27,179 to 27,955

within the period July 2017 to July 2018. Within the same period the number of passengers grew by 1,077,546.

1.2.1 Civil Aviation Regulation

Due to the nature of the aviation industry, the industry is one of the heavily regulated industries in the country, requiring regulation from a specialized agency of the United Nations referred to as ICAO. The main duty of this agency is to manage air transport through proper planning and development so as to foster safe and sustainable growth. ICAO is responsible for developing civil aviation regulations, providing acceptable standards and recommending practices which are to be adopted by member states. (United Nations, 1944).

Kenya as a contracting state to ICAO established the Kenya Civil Aviation Authority through an act of parliament on 4th October 2002. The KCAA is charged with regulation and oversight of aviation safety and security, economic regulation of air services and development of civil aviation, provision of Air Navigation Services (ANS), and training of aviation personnel (KCAA, 2012).

The civil aviation regulations within the KCAA framework are divided into the following main categories; civil aviation regulations, the civil aviation act and the consumer regulations of 2017. The current study conceptualizes the regulations using the following key indicators; the operation of aircraft by domestic airlines was contextualized using operational requirements, maintenance requirements, passenger handling and flight crew requirements. The personnel licencing regulations was contextualized in terms of licencing and certification, training and testing as well as rating and authorization of domestic airlines.

The study further assessed the air operator and administration regulations in terms of; certification requirements, flight operations management as well as the safety and security management requirements. Lastly the study measured the Remotely Piloted Aircraft Systems-RPAS regulations of 2017 which are aimed at regulating the operation of drones within Kenya. This was contextualized in terms of; registration of RPAS organizations, operational requirements (commercial and recreation) and the security requirements.

1.2.2 Growth of Domestic Airlines

Growth is defined in terms of the amount of revenue generated, value added and expansion in the volume of business. Further, growth can be attached to qualitative measures such as the market share enjoyed by a firm; it's market position, the quality of the product and the customer goodwill (Barbero, Casillas, & Feldman, 2011). The growth of a business is a vital indicator of the performance of an organization. There are a number of factors like access to and utilization of resources, personnel capabilities which play a central role in the growth of an enterprise and differentiate it from non-performing firms (Memba, Gakure, & Karanja, 2011).

The growth of the domestic airline industry is largely measured by the level of traffic, the fleet number, the number of local operators, level of cargo and increased adoption of new technologies within the industry (Mhlanga, Steyn, & Spencer, 2018). This industry is key in the economic development of all countries, especially developing countries like Kenya. The industry contributes to passenger transport, mail and cargo transport (Lock, Fattah, & Kirby, 2010).

The industry is also key in providing employment opportunities to pilots and attendants, and smaller industries which grew as a result (Nderu, 2013). From the

above it is evident that the airline industry growth is key to the economic progress of a country. The International Air Transport Association (IATA) recently carried out a study on market share of passengers and found out that African airlines only had 2.2% of the entire market share of passengers (WATS, 2016). The current research measured the growth of airlines in Kenya in terms of the number of operators, the size of domestic traffic, adoption of new technologies and the number of aircraft. (*See Appendix II*)

With the emergence of a global market; the need for local, affordable and accessible airlines emerged. This gave birth to the current host of domestic airline firms who offer not just business flight, but also leisure and cargo flights within the country. Further with the increasing campaign for domestic tourism and a growing middle class, there has been an upsurge in domestic air travel demand. There are currently 67 domestic airline firms in the country who are regulated by the Kenya Civil Aviation Authority with their main hubs being at Jomo Kenyatta International, Wilson, Nanyuki and Moi International airports.

1.3 Statement of the Problem

The Kenya Civil Aviation Regulations [KCARs] were released by the KCA in 2008 but these were repealed by the year 2013. Similar regulations were rolled out by neighbouring countries during this period. The introduction of these regulations into the region has resulted in irregular spikes and dips in performance of the domestic airline industry. These new regulations were introduced due to recommendations by the ICAO Standards and Recommended Practices (SARPs).

Low and Yang (2018) in their study on effects of human, technical and operating factors on aviation safety concluded that airworthiness of aircraft and air navigation

services enhanced airline services. The study however considered the Chinese Aviation Industry. Singh, Sharma, Chadha, and Singh (2019) examined moderating effects of multi group on safety performance in India and concluded that safety management systems and human factors enhanced the safety performance of airlines. Mhlanga, Steyn, and Spencer (2018) examined the drivers of operational efficiency in the airline industry in South Africa and indicated that executional drivers (business model and revenue per aircraft) and structural drivers (long term planning and policies) had a significant effect on efficiency of airlines. The study however did not examine causality between civil aviation regulations and domestic airline industry growth.

These new regulations have seen air operators reconfiguring their organizational structure by nominating postholders, increasing available manpower and increasing the number/frequency of audits and inspections. These new regulations require more compliance, resulting in a safer but more regulation procedures, increasing the incurred operational costs (Kenya Civil Aviation Authority, 2013). Despite this, there has been minimal research interest or industry evaluation of how these regulations have impacted the growth of the domestic airline industry in Kenya. This study is borne out of the urge to fill this gap and elucidate statistical evidence that can be utilized by regulators in future review of the regulations and promotion of growth within the industry.

1.4 Research Objective

The main objective of the study is to examine the effect of civil aviation regulations on the growth of the domestic airline industry in Kenya.

1.4.1 Specific Objectives

- i. To determine the effect of operation of aircraft regulations on the growth of the domestic airline industry in Kenya.
- ii. To examine the effect of personnel licensing regulations on the growth of the domestic airline industry in Kenya.
- iii. To establish the effect of air operator and administration regulations on the growth of the domestic airline industry in Kenya.
- iv. To examine the effect of RPAS regulations on the growth of the domestic airline industry in Kenya.

1.5 Research Questions

- i. How do the operation of aircraft regulations influence growth of the domestic airline industry in Kenya?
- ii. What is the effect of personnel licencing regulations on growth of the domestic airline industry in Kenya?
- iii. What is the effect of air operator and administration regulations on the growth of the domestic airline industry in Kenya?
- iv. How do the RPAS regulations influence the growth of the domestic airline industry in Kenya?

1.6 Scope of the Study

The contextual scope of the study was limited to an examination of civil aviation regulations in Kenya and the growth of the domestic airline firms. The geographical scope of the study was limited to domestic airline firms operating within Kenya. The majority of the airlines have their head offices at Jomo Kenyatta International, Wilson, Nanyuki and Moi International Airports. The study scope was also be limited to a census of the Chief Finance Officer or the Operations Manager of 67 airline firms in

Kenya. The design of the study was limited to an explanatory approach that guided the examination of the causal link between the research variables.

1.7 Significance of the Study

The results of the study are also expected to foster managerial competency within the local airline firms. The results will be instrumental to the management team in their decision-making process as well as equipping the management personnel with knowledge on the regulations that they can leverage on to enhance their growth potentials.

The study is expected to have future importance to the domestic airline industry policies, practices and scholarly works. To the policymakers and other industry stakeholders including the general public, the findings of the research will be essential in demystifying the causal link between the regulatory requirements and the growth of the industry. The findings will shed light on the strengths and weaknesses of the civil regulations as far as the growth of the industry is concerned.

The findings of the study are also expected to enhance the public awareness on the civil regulations within the domestic airlines. The results will also support the public knowledge on the ongoing debate for RPAS regulations and the inherent commercialization of the new unmanned vehicles. Finally, the results of the study are also expected to stimulate future research work on the performance of the domestic airline industry. Hence this research work will form the basis for future reference and scholarly knowledge.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The second chapter of the study is concerned with the examination of the civil aviation regulatory environment in Kenya and how it affects the growth of the domestic airline industry. The chapter specifically examined the theoretical assumptions of the study, the empirical review of related literature, the research gaps as well as the conceptual framework of the study.

2.2 Theoretical Review

The current research was founded on the configurations theory that was developed by Doty and Huber (1993).

2.2.1 Configuration Theory

This theory was conceived by Doty and Huber (1993) and it identifies how the environment of an organization influences its performance. In the current study the environmental dimension will be reflected through the civil aviation regulations. The proponents of the theory indicate that the environmental influence on the organization has motivated many researchers to examine the connection between environmental effects and the organization performance.

The main tenets of the configuration theory are the fit concept, configurational thrift, equifinality thinking, and discontinuity of transition. The fit concepts holds that operations strategies fit with integrative measures to result into better firm competitiveness. The equifinality principle holds that it is possible to attain the same goals irrespective of the starting point. This means that the organization can utilize different regulatory combinations to achieve better performance within the sector. The

configurational thrift holds that there is a limit of the successful configurations that an organization can partake. The concept of fit and equifinality helped in guiding how the civil aviation regulations can be harnessed to result into the aviation sector growth.

2.3 Empirical Review

2.3.1 Domestic Airline Growth

Over the last ten years, the African continent has seen an increase in air traffic and with this, there has been an increase in the number of domestic, regional and foreign carriers. This has led to the need for the development and adoption of effective regulations which can cover the safety and security of aviation equipment and users, ensure effective management of the national airspace, improve airport training and maintenance standards and licencing of personnel, factors which lead to sustainable growth and improve the competitive advantage of airlines. It is, however, unfortunate that most governments have failed to take the necessary and deliberate regulatory steps to safeguard the industry (AFDB, 2012)

Between 2011 and 2015, airline firms operating in Sub-Sahara Africa recorded the highest aircraft accident rate in the world. Accidents involving turbo prop aircraft stood at 10.51 accidents per one million sectors flown and those involving jet aircraft stood at 2.5 accidents for every one million sectors flown. Most of these accidents were caused by latent factors such as flightcrew errors, external threats and poor condition of the aircraft in use. It was noted that 52% of these accidents occurred due to a lack of efficient regulations and/or regulatory oversight. (International Air Transport Association, 2016).

InterVISTAS Consulting (2017) carried out a research on behalf of the East African Business Council on the impacts of “Open Skies” to the East African Community and noted that full liberalization of the airspace would significantly improve the economic

state of the region, resulting in economic growth due to the growth of supporting industries. Tchouamou (2013) studied the relationship between aviation and tourism the effect of implementing the Yamoussoukro Decision and concluded that this would increase the levels of growth of firms operating in the aviation industry, ultimately improving tourism in the region.

According to KAA the airline industry business both in terms of cargo and passenger traffic has been growing at a rate of more than 9% from 2005 to 2011. There were 36 international airlines, as at 31st December 2011 operating (Kenya Airports Authority, 2011). KAA (2017) reports that most of the small domestic airlines had been reporting an average of 10% operating losses within the financial year despite an increase in local traffic. The report further indicated that the domestic airline was largely dominated by a few firms with the majority of the smaller domestic firms reeling from the over-competitive environment. Hence this study sought to examine how civil aviation regulation influences the growth of the aviation sector in Kenya.

2.3.2 Operation of Aircraft Regulations and the Growth of Airlines

Under the Civil Aviation Act (2013); legal notice 126 of 2018 outlines the regulations that will govern the operation of aircraft for commercial air transport. The regulation guides the operation requirements, maintenance requirements, passenger handling and flight crew requirements of registered airlines in Kenya. Mallikarjun (2015) conducted a study examining the efficiency of US airlines: a strategic operating model. The study sought to determine how the strategic operations model influenced the performance of major and national airlines within the year 2012. The results of the study showed that major airlines were more efficient due to meeting operational requirements than domestic airlines. The study however failed to take into consideration the growth metrics of the domestic airlines which the current study examined.

Van Boekhold, Faghri, and Li, (2014) evaluated the security screening checkpoints for domestic flights using a general microscopic simulation model. The study examined the operational efficiency of passenger screening, the operating security measures of domestic flights and how they influence customer service. The findings of the research showed that reduced queue wait-time and enhanced safety within domestic airlines enhanced customer experience and ultimately revenues. The study was conducted among airlines in the US; hence findings may not be replicated within the current study that focusses on the Kenyan domestic firms.

Archana and Subha, (2012) examined the service quality and passenger satisfaction on Indian airlines. The study employed a structured questionnaire in collecting data from 270 passengers. The results of the data analysis indicated that in-flight service quality was associated with increased traffic within an airline. The study results also showed that back-office operations and digitalization of airline operations was positively related with growth in number of customers and satisfaction levels. The study focussed on customer satisfaction whereas the current research considered the business growth of the aviation sector in Kenya.

Carlucci, Cirà, and Coccorese, (2018) undertook a research measuring and explaining airport efficiency and sustainability: Evidence from Italy. The study employed data envelopment analysis of 34 airports in Italy for the period 2006-2016. The results of the study showed that adherence to regulation on the technical and scale efficiency of airports influenced the efficiency and sustainability of the airports positively. The current study however seeks to examine how civil aviation regulations influence airline firms growth not the efficiency of airports.

Adediran, (2016) examined current regulation on air carriers' liability and compensation issues in domestic air carriage in Nigeria. The study relied on review of secondary data. Study results showed that the current legal regime under the operational requirements of carrier's licencing ensured that there are no impediments to compensation of passengers and third-party. The study review also noted that there had been an upsurge in domestic aviation services uptake. The study relied on secondary data only whereas the current research utilized both primary and secondary data.

Imbiti, (2016) studied the integration flow management and efficiency of operations in the Kenyan aviation industry. The study employed a descriptive research design with semi-structured questionnaires being adopted to collect primary data. The results of the regression analysis indicated that process reengineering, adoption of points view and integral reorganization were key to improved efficiency within the aviation industry. The study however failed to examine how civil aviation regulations influenced the efficiency within the domestic airline industry.

2.3.3 Personnel Licencing Regulations and the Growth of Airlines

According to the KCAA 2013-2017 strategic plan, the personnel licencing role is concerned with the aircraft registration, aviation personnel licensing, surveillance and ATO certification. Under the Civil Aviation Act (2013); legal notice 95 of 2018 lays the guidelines for personnel licencing within domestic airline firms in Kenya. Personnel licencing focuses on the licencing and certification, training and testing as well as the rating and authorization of personnel within the aviation sector.

Karatepe and Vatankhah, (2015) researched on high-performance work practices, career satisfaction, and service recovery performance: a study of flight attendants. The

study sampled flight attendants in Iran with a time lag of two weeks in the data collection process being employed. The study further employed the structural equation modelling technique in the data analysis. The findings of the research indicated that selective staffing, empowerment and career opportunities were key indicators of high performance work places. The study however failed to indicate if there is any link between the high-performance and regulations and subsequent growth in domestic airlines.

Park, Lee, Kwon, and del Pobil, (2015) examined the determinants of behavioural intention to use South Korean airline services: Effects of service quality and corporate social responsibility. The study employed structural equation modelling in the analysis. The findings of the study indicated that competency of licenced personnel enhance the in-flight service quality which enhanced the customer satisfaction levels with notable connection being shown on the behavioural intention to utilize the airline. The study however considered only South Korean Airline whereas the current study factored all the domestic airline firms in Kenya.

Saranga and Nagpal, (2016) studied the drivers of operational efficiency and its impact on market performance in the Indian Airline industry. The study utilized both primary and secondary data to examine domestic and international airlines operating in India in the period 2005-2012. The study utilized the data envelopment analysis technique with performance being examined using generalized least squares and the Tobin model. The findings of the study indicated that regulatory factors such as airworthiness of the airline's aircraft and experience of the staff influenced the performance of airline. The results also showed that increased technical efficiency was also associated with better market performance. The study considered the individual market

performance of airlines whereas the current study examined the general growth in the aviation sector in Kenya.

Low and Yang, (2018) conducted an exploratory study on the effects of human, technical and operating factors on aviation safety covering 50 airlines operating between 2004 and 2015. The study considered remuneration of pilots, the age of fleet, International Air Transport Association - Operational Safety Audit (IOSA) certification, International Civil Aviation Organization safety parameters (i.e., legislation, organization, licensing, operations, airworthiness, accident investigation, air navigation service, and aerodromes). The findings of the study indicated there was positive effect of airworthiness of aircraft, pilot salary, air navigation services and the accident rates within the airlines. The study however failed to examine how other civil aviation regulations i.e. operation of aircraft affected the growth of the airlines.

Njeru, (2015) examined the factors that influence safety in aviation firms: the case of Kenya Civil Aviation Authority. The results of the study showed that concentration of professional staff influenced the growth of the industry. Within KCAA the researcher indicated there was poor recruitment and retention policies, ageing personnel and poor staff development which resulted in poor aviation safety within the industry.

2.3.4 Air Operator and Administration Regulations and the Growth of Airlines

The Civil Aviation Act (2013) in legal supplement 92 of 2018 calls for regulations targeting air operator certification and administration requirements. The legal supplement outlines the key areas of the regulation into; certification requirements, flight operations management and safety and security management. Chang, Shao, and Chen, (2015) examined performance evaluation of airport safety management systems in Taiwan. The study sought to examine the adoption and compliance with ICAO 2005

regulations on Safety Management Systems implementation within three airports in Taiwan. The study findings indicated that the airports had well implemented safety risk management components as well as safety policies and objectives in place. The study however failed to examine if the safety and security management guidelines had any influence on growth of the aviation industry hence the current study bridged the gap.

Ismaila, Warnock-Smith, and Hubbard, (2014) examined the impact of air service agreement liberalisation: the case of Nigeria. The paper considered a 10-year period since air service liberalization was introduced in Nigeria. The policy-making process and examination on air service agreements was limited to Bilateral Air Service Agreement, Open Skies Agreement and Yamoussoukro Declaration. The results of the study indicated that air service liberalization in the market could result in 65% increase in passenger traffic while liberalization of carrier control and ownership would result in 34% increase in passenger traffic. The study was carried out of the current study limits hence may not be an accurate representation of the current study.

Meichsner, O'Connell, and Warnock-Smith (2018) examined the future for African air transport: Learning from Ethiopian Airlines. The reserachers noted that most airlines in Africa had been limited by regulatory restrictions, protectionism and inadequate infrastructure. The researchers noted that increased strategic alliance between Ethiopian Airlines and other air operators within the region was positively related to the airline growth in fleet number, passenger traffic and destinations. The study considered only Ethiopian Airlines which is the largest commercial airline firm in Africa whereas the current study focused on the Kenyan aviation sector in general.

Irandu, (2018) examined Air transport security in Kenya. In his review the author noted that in Kenya there have been structural and policy changes geared towards promoting better and effective air operations management. The researcher noted that expansion of aerodromes coupled with tougher regulation of the sector had fostered the growth of the industry which had been witnessed in increase in traffic, contribution of the airline industry to the GDP and increase in number of domestic operators. The study failed to take into consideration the civil aviation regulations effect on the growth of the industry.

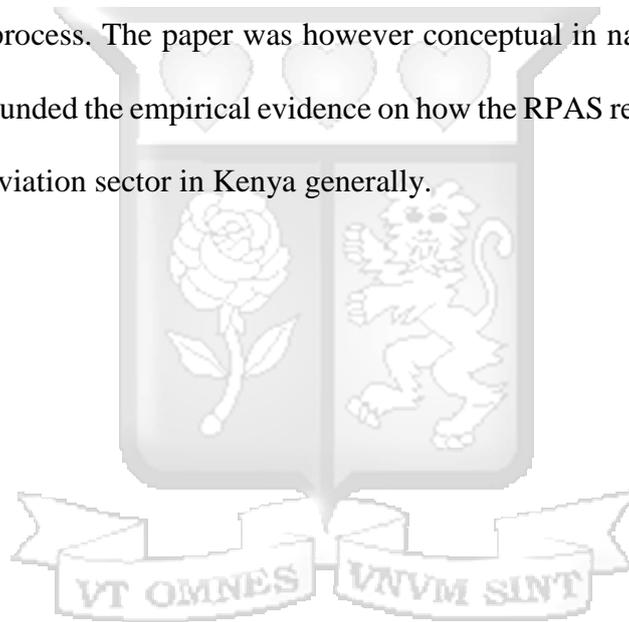
2.3.5 RPAS Regulations and the Growth of Airlines

The Civil Aviation Act (2013) in legal supplement 259 formulated the remote piloted aircraft systems regulations set to govern the acquisition, licencing and operation of RPAS in Kenya. The regulations specifically guide the registration of RPAS organizations, operational requirements (commercial and recreation) and security requirements. Wanjala, (2015) undertook an examination of drones in Kenya. The reseracher noted that the licencing of drone usage within the country was expected to herald a new era of increased uptake of the remotely-piloted aircraft. The research paper however was not able to examine if the licencing requirements did actually materialize in growth in drone usage locally hence the current study bridged this gap.

Jones, (2017) conducted a survey of international commercial drone regulation. The reseracher noted that increased usage of drones globally has contributed to the incorporation of drones into the aviation regulatory frameworks. The researcher noted that the drone regulations in Kenya were categorized as an effective ban since the formal process for commercial drone licencing and the requirement therein were too stringent to be met by majority of the potential users. The review however failed to examine if the Kenyan regulations have affected the growth of aviation sector.

Stöcker, Bennett, Nex, Gerke, and Zevenbergen (2017) conducted a review of the current state of UAV regulations. The reserachers noted that legal frameworks regulating the use of UAV had limited research and development within the sector.

Wayumba, Mwangi, and Chege, (2018) examined the application of unmanned aerial vehicles in improving land registration in Kenya. The study employed a case study research design in examining the utilization of drones in Kenya land registration. The study collected data through phone interviews with staff at KCAA. The research concluded that with supportive regulations the use of drones in land registration would enhance the process. The paper was however conceptual in nature hence the current research expounded the empirical evidence on how the RPAS regulations of 2018 have affected the aviation sector in Kenya generally.

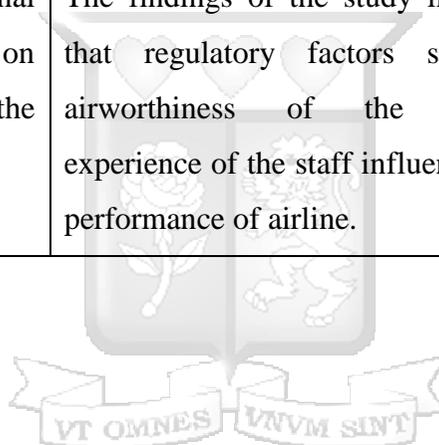


2.4 Summary of Literature and Research Gaps

Table 2.1 Research Gaps

Author	Title	Findings	Gap
Carlucci, Cirà, and Coccoresse, (2018)	Measuring and explaining airport efficiency and sustainability: Evidence from Italy	The results of the study showed that adherence to regulation on the technical and scale efficiency of airports influenced the efficiency and sustainability of the airports positively.	The current study however seeks to examine how civil aviation regulations influence airline firms growth not the efficiency of airports.
Irandu, (2018)	Air transport security in Kenya.	The researcher noted that expansion of aerodrome coupled with tougher regulation of the sector have fostered the growth within the industry	The study failed to take into consideration the civil aviation regulations effect on the growth of the industry.
Mallikarjun (2015)	The efficiency of US airlines: a strategic operating model	The results of the study showed that major airlines were more efficient due to meeting operational requirements and operational expenses than national airlines.	The study however failed to take into consideration the growth metrics of the national airlines which the current study examined.

Author	Title	Findings	Gap
Meichsner, O'Connell, and Warnock-Smith (2018)	The future for African air transport: Learning from Ethiopian Airlines.	The researchers noted that increased strategic alliance between Ethiopian Airlines and other air operators within the region was positively related to the airline growth	The study considered only Ethiopian Airlines which is the largest commercial airline firm in Africa whereas the current study focused on the Kenyan aviation sector in general.
Saranga and Nagpal, (2016)	Drivers of operational efficiency and its impact on market performance in the Indian Airline industry	The findings of the study indicated that regulatory factors such as airworthiness of the airline, experience of the staff influenced the performance of airline.	The study considered the individual market performance of airlines whereas the current study examined the general growth in the aviation sector in Kenya.



2.5 Conceptual Framework

The conceptual framework below sought to examine the effect of civil aviation regulations on the growth of aviation sector in Kenya

Independent Variable

Dependent Variable

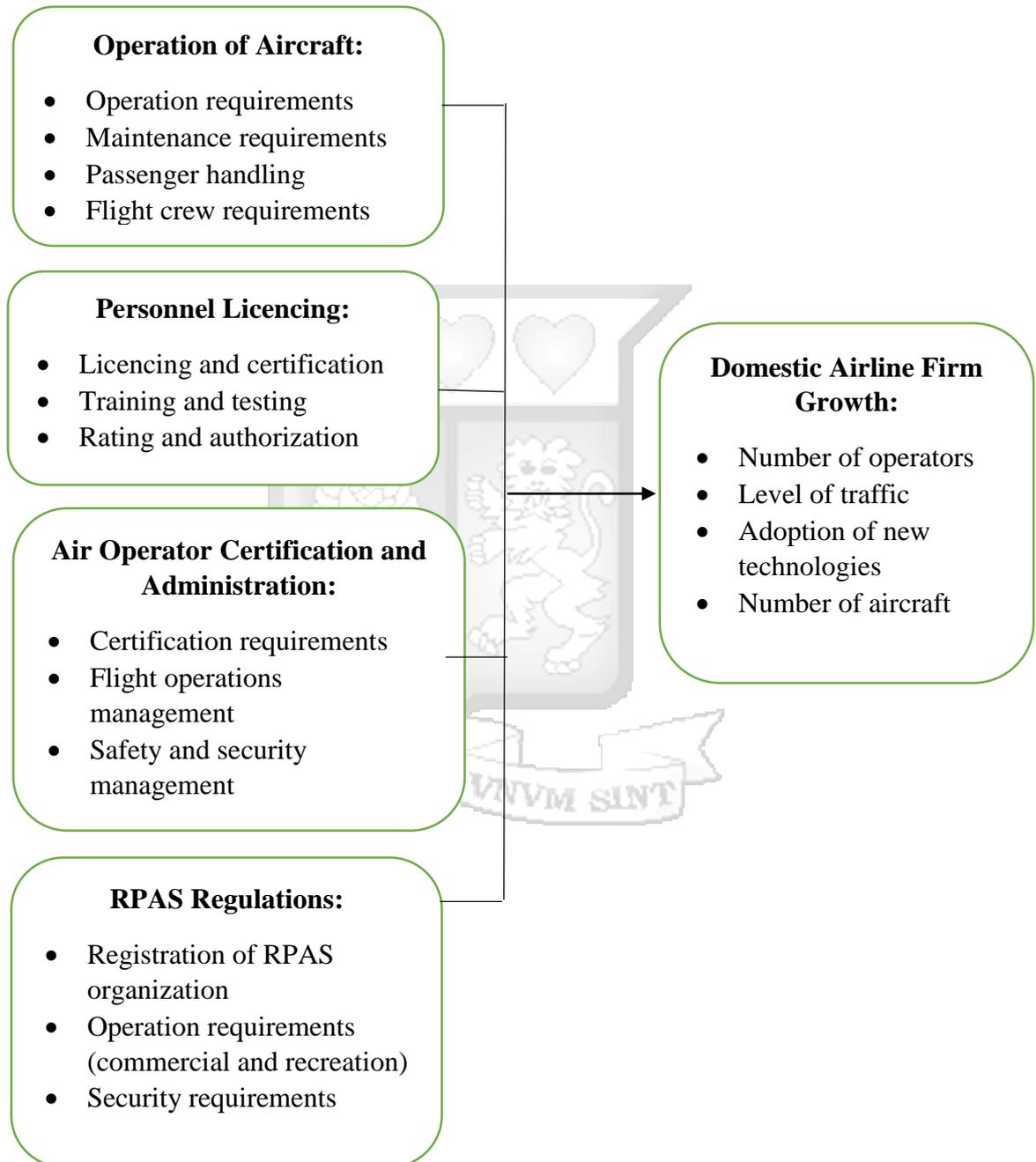


Figure 2.1 Conceptual Framework

The above conceptual framework depicts the causal link between civil aviation regulations and the growth of domestic airlines in Kenya. The study conceptualized

the civil aviation regulations into four main components; operation of aircraft, personnel licencing, air operator certification and administration as well as the RPAS regulations. The growth of the domestic airlines was measured using the number of operators, the level of airline traffic, the adoption of new technologies and the number of registered aircraft.

Table 2.2 Operationalization of Variables

Objective	Variable	Measurement	Data collection	Data Analysis
Operation of Aircraft	<ul style="list-style-type: none"> • Operation requirements • Maintenance requirements • Passenger handling • Flight crew requirements 	Quantitative data	Structured questionnaire	Descriptive Correlation tests Regression tests
Personnel Licencing	<ul style="list-style-type: none"> • Licencing and certification • Training and testing • Rating and authorization 	Quantitative data	Structured questionnaire	Descriptive Correlation tests Regression tests
Air Operator Certification and Administration	<ul style="list-style-type: none"> • Certification requirements • Flight operations management • Safety and security management 	Quantitative data	Structured questionnaire	Descriptive Correlation tests Regression tests
RPAS Regulations	<ul style="list-style-type: none"> • Registration of RPAS organization • Operation requirements (commercial and recreation) • Security requirements 	Quantitative data	Structured questionnaire	Descriptive Correlation tests Regression tests
Domestic Airline Firm Growth	<ul style="list-style-type: none"> • Number of operators • Level of traffic • Adoption of new technologies • Number of aircraft 	Quantitative data	Structured questionnaire	Descriptive Correlation tests Regression tests

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The third chapter of this study is concerned with the methodology that guided the solving of the research problem. The chapter concisely examined the design that was utilized, the population of the study, the sampling design and the data collection methods. The chapter further outlined the pilot testing procedures, the data analysis and the ethical consideration that were observed.

3.2 Research Design

A research design is a structure, plan and strategy of investigation so conceptualized as to obtain answers to research questions or problems. The plan is the whole scheme or system of the research (Kumar, 2011). It is the arrangement of conditions for collection and analysis of information in a manner that aims to incorporate relevance to the research purpose with economy in procedure (Sekaran, 2007). The current research employed an explanatory research design. This was selected for the study since it will be pivotal in examining the causal link between civil aviation regulation and the growth of domestic airlines. Further the design enabled the testing of the research questions using correlation statistics on the association of variables.

3.3 Target Population

Kothari (2011) and Kombo and Tromp (2011) observed that a population consists all elements with observable characteristics. These scholars agree that a proper population should have characteristics desirable to the interest of the researcher in his study. There are 67 domestic airline firms operating from their main hubs at Jomo Kenyatta International, Wilson, Nanyuki and Moi International airports. The study

targeted the Chief Finance Officers or Operations Managers from each of the firms hence the target population was 67 respondents. The population was selected for the study since they are deemed to have sufficient knowledge on civil aviation regulations in play locally and the domestic airline industry.

Table 3.1 Target Population

Position	No of Firms	No of Personnel
Chief Finance Officer / Operations Manager	67	67*1 = 67
Target Population		67

3.3.1 Sampling Design

A sampling frame facilitates formation of a sampling unit that refers to one member of a set of entities being studied which is the material source of the random variable (Bailey, 2008). The study sample frame was the 67 airline firms from which one personnel member was selected. The research adopted a census survey of all the respondents to ensure there is adequate representation and equal chance of all respondents being sampled. The sample respondents for the study was the 67 respondents.

3.4 Data Collection Methods

The research relied on both primary and secondary data. The main data collection tool was a semi-structured questionnaire. This was constructed in line with the research objective. The study further utilized secondary data that was sourced from both Kenya Airports Authority, the Kenya Civil Aviation Authority as well as industry reports and journals. The study an electronic mailing of the research instrument to the respondents.

This enhanced the quality of the data collected as well as ease of the data collection process. To support this the researcher sought the assistance of a single research assistant in the data collection process.

3.5 Pilot Testing

Kothari (2004) argues that before using a questionnaire as a data collection method, it is always advisable to conduct pilot studies of the questionnaires. This helps to bring into light the weaknesses (if any) of the questionnaires and the experience gained in this way can be used to effect improvement. A pilot test of 7 candidates was carried out and it was composed of respondents who were not involved in the main research. The results of the pilot testing showed some errors with the labelling of some of the scales in use. These errors were subsequently corrected and the accurate questionnaire sent out to the final respondents.

3.5.1 Reliability Tests

Reliability is defined as the degree of consistency of a research instrument over several trials. It can be internal or external. Internal reliability is the extent to which data collection, analysis and interpretation remains consistent. If multiple data collectors are used, they should agree. External reliability is the extent to which the results can be replicated. It is ensured by the quality of the researcher. The study relied on the internal reliability. This was measured through use of the Cronbach Alpha. All research variables with an alpha score of 0.7 and above were considered in the research.

Table 3.2 Reliability Test

Civil Regulations and the Growth of Aviation			
Variable	Cronbach's Alpha	Number of Items	Comment
Growth of domestic airline industry	.770	5	Accepted
Operation of aircraft	.842	4	Accepted
Personnel licencing	.735	5	Accepted
Air operator certification and administration	.745	4	Accepted
Overall Reliability Statistics	.773	4	Accepted

Source: Researcher (2019)

From the results of the study the metrics that were used to measure the growth of domestic airline industry $\alpha = .770$, personnel licencing $\alpha = .842$, were good as indicated in Table 3.3 above.

Findings also revealed that operation of aircraft $\alpha = .735$, and air operator certification and administration $\alpha = .745$ were acceptable to be utilized in solving the research problem since all the Cronbach Alpha were above 0.7. The overall reliability statistics was 0.773 which was above the threshold of 0.7 hence the constructs were accepted for the study.

3.5.2 Validity Tests

Validity is the degree which a research instrument measures what it is supposed to measure. Construct validity and content validity was relevant in this study. Construct validity measures the degree to which obtained data reflects the item under study. This was measured by ensuring that all the constructs indicated in the conceptual framework are captured in the research instrument. Content validity measures the degree to which the collected data represents a specific domain of indicators or content

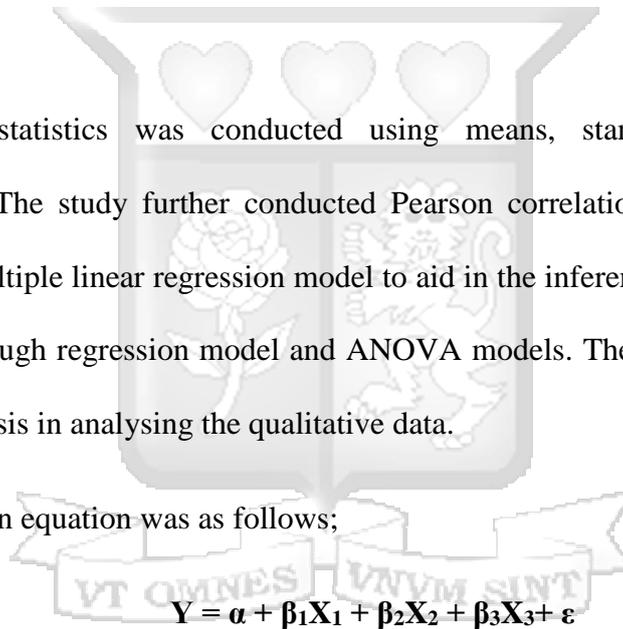
of a particular concept (Kothari, 2004). This was assessed by the help of the supervisor in examining that the questionnaire is in line with the research premises. This process allows weaknesses in the questionnaire to be detected so that they can be removed before the final questionnaire is prepared.

3.6 Data Analysis

The study relied on both qualitative and quantitative data. The quantitative data was analysed with the use of computer-aided analytical programmes. The data collected was then coded into SPSS 23 for analysis through descriptive statistics and inferential statistics.

Descriptive statistics was conducted using means, standard deviations and frequencies. The study further conducted Pearson correlation analysis. The study adopted a multiple linear regression model to aid in the inferential analysis. This was analyzed through regression model and ANOVA models. The study further adopted content analysis in analysing the qualitative data.

The regression equation was as follows;



The watermark is a large, light grey crest of a university. It features a shield with a rose on the left and a lion on the right. Above the shield are three hearts. Below the shield is a banner with the Latin motto "VT OMNES VNVM SINT".

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Y = Growth of domestic airline firms

X₁ = Operation of aircraft

X₂ = Personnel licencing

X₃= Air operator certification and administration

The statistical significance of the research model was tested at a 5% significance level.

The collected qualitative data was analysed using content analysis. This was

conducted in line with the research objectives. The analyzed data was presented in charts, figures and tables.

3.6.1 Diagnostic Test

To ensure there are no diagnostic problems the study conducted the following tests to examine the underlying linear regression assumptions prior to undertaking the regression analysis.

Table 3.3 Diagnostic Tests

Test	Significance	Test used	Conclusion
Normality	Assist in determining the shape of the distribution.	-Shapiro-Wilk test	-If P-value < 0.05, data is normally distributed
Multicollinearity	Checks for the strength of the correlations among the independent variables	Variance Inflation Factor (VIF)	If VIF for one of the variables is around or greater than 10, there is multicollinearity

3.7 Ethical Issues in the Research

The study adopted ethical considerations in the course of the research. Prior to undertaking the research, a debriefing of research assistant was conducted to ensure he was conversant with the study objectives and scope of the research. The study also sought a research permit from NACOSTI to ensure that the research is licenced to be conducted in the country. The study further sought clearance from the Ethical Review Body of Strathmore Business School before starting the data collection process. Further to this the researcher also ensured that the confidentiality of the respondents was maintained in the course of the research.

CHAPTER FOUR

PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

The fourth chapter presents the findings of the research. The chapter was aligned with the research objectives and presented both the descriptive and inferential statistics. The chapter specifically was arranged in the following order; the response rate, the background information, the descriptive statistics, the correlation analysis, diagnostic tests and the regression analysis.

4.2 Response Rate

The research sought to collect responses from 67 respondents within the domestic airlines. The study was able to obtain an 88% response rate; representing 59 respondents while only 12% of the respondents did not take part in the main study. This response was deemed adequate for the statistical analysis as indicated by Kaplowitz, Hadlock, and Levine (2004) assert that a response rate of above 60% is reliable for statistical analysis; meaning that the available response rate is efficient for analysis.

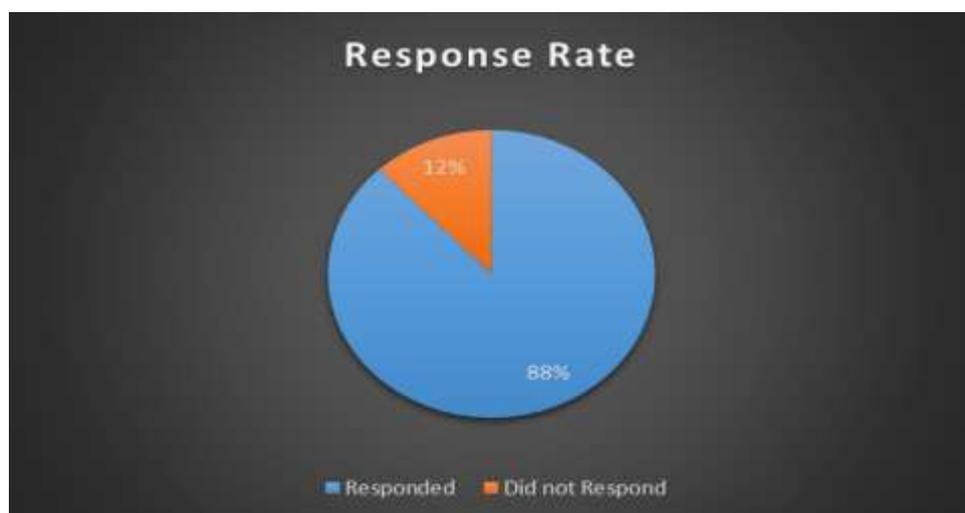


Figure 4.1 Response Rate

4.2.1 Background Information

4.2.1.1 Gender of Respondents

The study sought to determine the gender composition of the respondents. Study findings are presented in Table 4.1 below;

Table 4.1 Gender of Respondents

		Frequency	Percentage
Valid	Male	30	50.8
	Female	29	49.2
	Total	59	100.0

The findings on the table above indicated that 51% of the respondents were male while only 49% of the respondents were female. This shows that gender equality within the domestic airline industry is optimal as shown in the almost equal representation in the top management levels.

4.2.1.2 Age of the Respondents

The research examined the age of the respondents within the domestic airline industry.

The results of the study are presented in Table 4.2 below;

Table 4.2 Respondents Age

		Frequency	Percent
Valid	18-30	11	18.6
	31-40	45	76.3
	41-50	3	5.1
	Total	59	100.0

Study findings showed that 76% of the respondents were between 31-40 years, 19% were between the ages 18-30 years while only 5% of the respondents were between ages 41-50 years indicating that most of the personnel in the domestic airline industry are middle aged which is an indicator of young talent being attracted to the sector.

4.2.1.3 Education Level of Respondents

The study sought to determine the education level of the respondents. Study findings are presented in Table 4.3 below;

Table 4.3 Respondents Education Level

		Frequency	Percent
Valid	Diploma	5	8.5
	Bachelor's Degree	29	49.2
	Post Graduate	25	42.4
	Total	59	100.0

Study findings showed that most respondents 49%, had attained a bachelor's degree, 42% had attained a postgraduate degree while only 9% of the respondents had a diploma level education. This indicates that the personnel within the industry have attained formal education as shown by their respective qualifications.

4.2.1.4 Length of Service

The research further sought to determine the length of service among the respondents. Study findings showed that most respondents, 61% had served for between 4-6 years, 25% had served for 7-9 years, 12% had served for more than 10 years while only 2% had served for between 1-3 years. This shows that the censuses respondents had the adequate experience within the industry hence were at an informed position to provide adequate feedback to questions put forward.

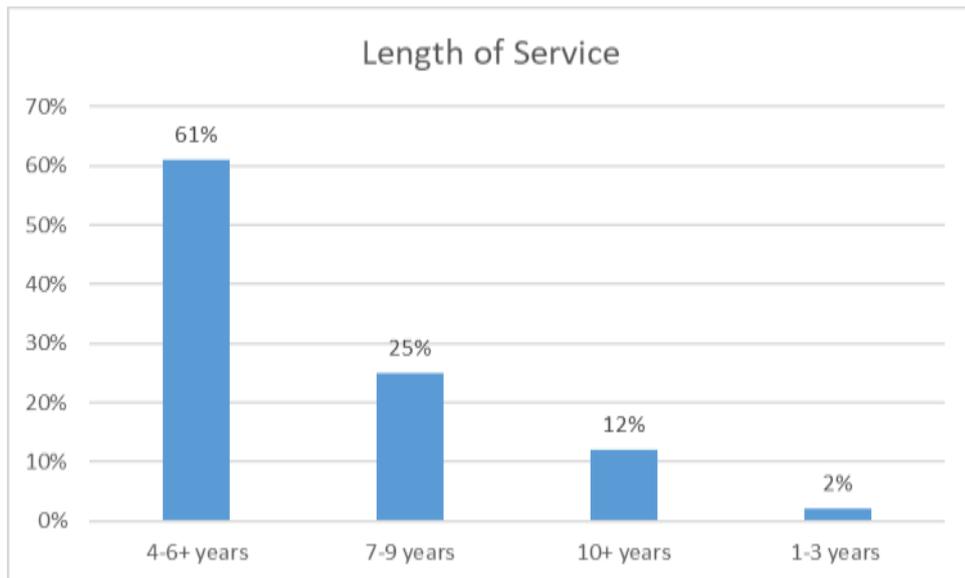


Figure 4.2 Length of Service

4.2.1.5 Job Category

The research sought to establish the respondent's job category. The results of the study are shown in Table 4.4 below;

Table 4.4 Job Category of the Respondents

		Frequency	Percent
Valid	Operations Manager	37	62.7
	Chief Finance Officer	22	37.3
	Total	59	100.0

Study findings showed that most respondents 63% were Operations managers within the domestic airline industry while 37% of the respondents were the Chief Finance Officers. This indicates that the respondents had the requisite knowledge on the civil aviation regulations and the growth of the domestic airline industry.

4.3 Descriptive Analysis

The study applied descriptive analysis in the tabulation of the responses obtained. The study relied on the sum, mean and standard deviation in analysis of the Likert scale questions. The following criterion was utilized in interpretation of the means; 0-1.50 being neither agree nor disagree; 1.51-2.50 being strongly disagree; 2.51-3.50 being disagree; 3.51-4.50 being agree and 4.51-5.00 being strongly agree.

4.3.1 Growth of the Domestic Airline Industry

The dependent variable of the study was the growth of the domestic airline industry.

The results of the study are presented in Table 4.5 below;

Table 4.5 Growth of the Domestic Airline Industry Descriptive

	N	Sum	Mean	Std. Deviation
There is an increase in the number of operators	59	277.00	4.6949	.65005
There is growth in the level of air traffic within the country	59	270.00	4.5763	.81375
There is increased adoption of new technologies	59	227.00	3.8475	.84718
There is increase in number of aircraft	59	268.00	4.5424	.67778
There is increase in cargo movement	59	219.00	3.7119	.94779

Regarding whether the number of operators increased within the domestic airline industry, a mean of 4.6949 showed strong agreement and a deviation of .65005 indicating minimal variation in the responses obtained. The above results resonate

with Memba, Gakure and Karanja (2011) who indicated that growth in local operators had increased employment opportunities and enterprise growth. Similarly KAA (2018) report indicated that there has been a continuous growth in air traffic in the country which had been achieved as a result of increase in the number of local operators.

Concerning whether there was growth in the level of air traffic within the country, a mean of 4.5763 showed strong agreement and a deviation of .81375. This also echoes the recorded industry statistics on the domestic airline industry (KCAA, 2012). The respondents agreed that there is increased adoption of new technologies within the domestic airline industry as shown by a mean of 3.8475 and a deviation of .84718 indicating minimal variation in the responses. Findings of the study also indicated that respondents agreed that there is increase in the number of aircraft among domestic aviation firms as shown by a mean of 4.5424 and a deviation of .6778. WATS (2016) is of a similar opinion that most medium-size airline firms have increased their technology adoption and flight numbers which has resulted in a competitive environment. The results of the study also indicated there was agreement among respondents that there is increase in the cargo movement within the domestic airline industry as shown by a mean of 3.7119 and a deviation of .94779 indicating moderate variation in the responses. The above findings confirm Nderu (2013) assertions that human and cargo traffic within the domestic airline industry has been expanding exponentially.

4.3.2 Operation of Aircraft Regulations

The research sought to establish the effect of operation of aircraft regulations on the domestic airline industry.

Table 4.6 Operation of Aircraft Descriptive

	N	Sum	Mean	Std. Deviation
Domestic airlines adhere to the operation requirements set by the regulator?	59	203.00	3.4407	.96973
Domestic airline players meet the maintenance requirements sent by the regulator?	59	200.00	3.3898	1.01738
There are adequate passenger handling capabilities by domestic airline firms	59	180.00	3.0508	.91771
Domestic airline firms meet the flight crew requirements set by the regulator	59	206.00	3.4915	.98913

In regard to the domestic airlines adherence to the operation requirements set by the regulator, there was disagreement among the respondents as shown by a mean of 3.4407 and a deviation of .96973 indicating moderate dispersion in the responses. In his study Mallikarjun (2015) indicated that adherence to operation requirements had a positive effect on the efficiency of airlines.

With regards to whether domestic aviation players meet the maintenance requirements sent by the regulator, there was disagreement among respondents as indicated by a mean of 3.3898 and a deviation of 1.01738 indicating a moderate variation. The results are consistent with Archana and Subha, (2012) who indicated that meeting operational requirements among airlines enhanced customer satisfaction which is a predictor of growth of the airline.

With regard to whether there are adequate passenger handling capabilities by domestic airline firms, there was disagreement among respondents as shown by a mean of 3.0508 and a deviation of .91771. The results are in line with Carlucci, Cirà, and

Coccoresse, (2018) who indicated that adherence to the regulations on efficiency within airports enhanced the efficiency of the airlines. In regard to domestic airline firms meeting the flight crew requirements set by the regulator, a mean of 3.4915 and a deviation of .98913 showed disagreement.

4.3.3 Personnel Licencing Regulations

The second variable of the study sought to determine the effect of personnel licencing requirements within the domestic airline industry.

Table 4.7 Personnel Licencing Descriptive

	N	Sum	Mean	Std. Deviation
Safety sensitive personnel within the are all licensed	59	166.00	2.8136	1.22439
Flight crew members within all aviation firms are all certified or licenced by KCAA	59	225.00	3.8136	1.39549
Personnel undergo routine training	59	207.00	3.5085	1.00641
Personnel within have met international rating standards	59	156.00	2.6441	1.30994
Flight crew undergo routine testing	59	213.00	3.6102	1.17469

Regarding whether the safety sensitive personnel within the domestic airline industry are all licensed, mean of 2.8136 showed agreement and deviation of 1.22439 indicated high variation. With regard to whether flight crew members are all certified or licenced by KCAA, a mean of 3.8136 showed agreement and a deviation of 1.39549 indicating high variation in the responses. The above results conform to the KCAA 2013-2017 strategic plan which calls for personnel licencing of airline personnel to be achieved within the short-term among domestic airline firms.

With regard to whether personnel within the domestic airline industry undergo routine training, a mean of 3.5085 and a variation of 1.00641 showed agreement. The above results are in line with Karatepe and Vatankhah, (2015) who indicated that regular training and empowerment of personnel was integral to a high performing airline. Concerning whether the personnel within the domestic airline industry have met international rating standards there was disagreement among the respondents as shown by a mean of 2.6441 and a deviation of 1.30994. In regard to whether flight crew within the Kenyan domestic airline industry undergo routine testing there was agreement among the respondents as shown by a mean of 3.6102 and a deviation of 1.17469 indicating high dispersion in the responses. These findings are not in agreement with Njeru, (2015) who indicated there was poor aviation safety and staff development locally. This shows that domestic airlines have been expanding their safety and empowerment programmes since the latter study.

4.3.4 Air Operator Certification and Administration Regulations

The third variable of the study sought to examine the air operator certification and administration requirements within the domestic airline industry. The results are presented below;

Table 4.8 Air Operator Certification and Administration Descriptive

	N	Sum	Mean	Std. Deviation
Domestic air operators have met the certification requirements as required by KCAA	59	185.00	3.1356	1.09004
Domestic air operators adhere to aviation security requirements	59	187.00	3.1695	1.03645
Domestic air operators meet safety requirements for handling of cargo and passenger traffic	59	178.00	3.0169	1.10628
Air operator meet and adhere to the maintenance requirements	59	197.00	3.3390	.95791

With regard to whether domestic air operators have met the certification requirements as required by KCAA, a mean of 3.1356 showed disagreement and a deviation of 1.09004 indicating moderate variation in responses. The findings are in line with Chang, Shao, and Chen, (2015) who indicated that not all airlines were able to meet all the air operator requirements adequately. Concerning the Domestic air operators adhere to aviation security requirements, a mean of 3.1695 and a deviation of 1.03645 showed disagreement. These findings are consistent with Ismaila, Warnock-Smith, and Hubbard, (2014) who posited that adherence to the aviation security requirements was wanting across many African airlines.

In regard to domestic air operators meeting safety requirements for handling of cargo and passenger traffic, a mean of 3.0169 and deviation of 1.10628 showed disagreement. Concerning the air operator meeting and adhering to the maintenance requirements, there was disagreement among the respondents as shown by a mean of 3.339 and a deviation of .95791 indicating minimal variation in responses obtained.

The results are supported by Irandu, (2018) who acknowledged that despite policy changes towards better air operations management; there were still gaps in meeting all the requirements laid down by international organizations.

4.3.5 RPAS Regulations

The fourth variable of the study sought to examine RPAS regulations. Currently the regulations are being debated within the National Assembly after the initial regulations that were drafted by KCAA were deemed flawed and did not consider general public and stakeholder participation. To this regard the study sought the views of the respondents on key issues surrounding the RPAS regulations.

With regard to how the anticipated regulations will affect growth of the industry, the majority of the respondents indicated that the regulations would foster the growth of the industry. Respondents pointed out that monitoring and control on the usage of drones will enhance their commercial utilization. Respondents further indicated that meeting regulatory requirements will ensure there is reduction of incidences where unmanned aerial vehicles may pose a risk to other aircraft.

Respondents further indicated that introduction of new legislation on RPAS will open the industry to new service frontiers that will spur growth within the industry. The respondents also noted that the regulations will ensure that only registered users are allowed to operate the drones which would lead to effective commercialization of the unmanned aerial vehicles.

Further the study sought the opinion of the respondents on what could pose limitations to the effective inclusion and operation of RPAS in Kenya. The respondents indicated that the security threat would be a major concern to industry regulators and the security agencies. The operation of the drones will need to be reviewed to ensure that their

operation does not cause a threat to conventional air travel. The respondents also indicated that stringent requirements and high fees to operate the drones may limit their usability in the country. The respondents also noted that a lack of experience in operating unmanned aerial vehicles, lack of civic education, poor infrastructure, violation of privacy laws and the high investment costs would pose a challenge to the inclusion and operation of drones.

The study further sought to establish the main challenges to the growth of the domestic airline industry. The findings indicated that poor regulatory effectiveness, lack of proper adoption of ICAO standards, poor infrastructure, high fare pricing, understaffing, insecurity and terrorism threat, inadequate financial capacity, cyclical business environment and lacklustre performance by the regulator were the main impediments to the industry's growth.

The study further probed the respondents on the key policy recommendations they would hope were adopted within the industry to spur growth. The responses indicated that policies on removal of tax on aviation fuel, creation of an independent quality assurance system, reduction of taxes on aviation products, enhancing the regulator capacity and employing skilled and experienced personnel were essential for the industry growth.

The response also showed that expansion of airports and airstrips, improvement of navigation facilities, enhancing aviation infrastructure, offering subsidies to new firms, separation of general aviation and private operator's requirements, increase in technology adoption and enhanced legal structures are also pertinent to better growth within the sector.

4.4 Inferential Analysis

4.4.1 Correlation Analysis

The study further sought to determine the association between the study variables. The research applied Pearson Correlation to examine the effect of the independent variables on the dependent variable. The independent variables for the study was the operation of aircraft regulations, personnel licensing regulations and Air operator certification regulations while the dependent variable for the study was the domestic airline growth.

Table 4.9 Correlation Matrix

Independent Variable		Airline Growth
Operation of aircraft regulations	Pearson Correlation	.434**
	Sig. (2-tailed)	.001
	N	59
Personnel licensing regulations	Pearson Correlation	.317*
	Sig. (2-tailed)	.014
	N	59
Air operator certification regulations	Pearson Correlation	.389**
	Sig. (2-tailed)	.002
	N	59

The first objective of the study sought to determine the effect of operation of aircraft regulations on the growth of the domestic airline industry in Kenya. The results of the research indicated that there was a moderately positive and significant effect of operation of aircraft regulations on the growth of the domestic airline industry $p = .434$, $sig = .001 < .05$. The above results are in line with Mallikarjun (2015) who concluded that meeting operational requirements was positively related with the performance of airlines.

The second objective of the study sought to examine the effect of personnel licencing regulations on the growth of the domestic airline industry in Kenya. The results of the research indicated that there was a weak positive and significant effect of personnel licencing regulations on the growth of the domestic airline industry $p = .317$, $sig = .014 < .05$. The results are consistent with the findings of Karatepe and Vatankhah, (2015) that selective staffing and empowerment of staff was positively related with high-performance. Low and Yang, (2018) also indicated that staff empowerment was positively related to operational performance.

The third objective sought to establish the effect of air operator and administration regulations on the growth of the domestic airline industry in Kenya. The results of the research indicated that there was a weak positive and significant effect of air operator and administration requirement on the growth of the domestic airline industry $p = .389$, $sig = .002 < .05$. Meichsner, O'Connell, and Warnock-Smith (2018) indicated that meeting administration requirements was positively related to growth of commercial airlines.

4.4.2 Diagnostic Tests

The research applied both normality and collinearity statistics in the analysis. The results are presented below;

4.4.2.1 Normality Test

In testing for normality, the researcher intended to assess whether there was normality in the distribution. In cases of data sets that have less than 2000 elements; the Shapiro-Wilk test is adopted; otherwise the Kolmogorov-Smirnov test is applied.

Table 4.10 Normality Test

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Growth of aviation	.296	59	.110	.856	59	.276
Operation of aircraft	.295	59	.111	.884	59	.289
Personnel licencing	.258	59	.200*	.908	59	.346
AOC and Administration	.125	59	.200*	.985	59	.974

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

For the current research, the Shapiro-Wilk test was adopted. The test states that for a normally distributed data, the sig. value should be 0.05 or greater. From the results on Table 4.10 above the significance value for all the predictor variables was above 0.05 hence the research concludes that the data was normally distributed.

4.4.2.2 Collinearity Statistics

Multicollinearity was carried out through the VIF and Tolerance value statistics to determine the possibility of interdependence between different variables.

Table 4.11 Collinearity Statistics

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Operation of aircraft regulations	.263	3.796
	Personnel licensing regulations	.365	2.737
	Air operator certification & administration regulations	.324	3.082

Table 4.11 shows that VIF values are all less than 10 meaning that there was no multicollinearity. The Tolerance value checks on the degree of Collinearity where a tolerance value lower than 0.1 shows that the variable could be considered as a linear

combination of other independent *variables*. All the tolerance values for the study were above 0.1 hence no collinearity problems.

4.4.3 Regression Analysis

The study sought to determine the magnitude of the effect of the civil aviation regulations on the growth of the domestic airline industry. The results of the regression analysis are as below;

Table 4.12 Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.442 ^a	.196	.152	2.90185	1.435

a. Predictors: (Constant), Air operator, Personnel licensing, Operation of aircraft

b. Dependent Variable: Growth of the domestic airline industry

The results on table 4.12 above examined the effect of civil aviation regulations on the growth of the domestic airline industry in Kenya. The results indicate that 19.6% ($R^2=.196$) variations in the growth of the domestic airline industry were explained by civil aviation regulations. The results show that other factors not considered in the research account for 81.4% change in the growth of the domestic airline industry. The results are in line with Mhlanga, Steyn, and Spencer (2018) who indicated that civil policies were key operational drivers of the efficiency of the airline industry. Singh, Sharma, Chadha, and Singh (2019) indicated that civil aviation safety and management systems were key to the performance of the domestic airline industry.

4.4.4 ANOVA Summary

The study further sought to examine the statistical significance of the research model. The study utilized the F-statistic results as the basis of testing the significance of the study model.

Table 4.13 ANOVA Summary

	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	112.655	3	37.552	4.459	.007 ^b
	Residual	463.141	55	8.421		
	Total	575.797	58			

a. Dependent Variable: Growth of domestic airline industry

b. Predictors: (Constant), Air operator, Personnel licensing, Operation of aircraft

The findings of the ANOVA model sought to examine the statistical significance of the model in determining the association between the study variables (civil aviation regulations*growth of domestic airline industry). The results indicated that the *f-statistic* = 4.459 > *F-critical* (1.162), *p-value* = .007 < .05. This indicates that the model was statistically significant and fit.

4.4.5 Regression Coefficients

The findings of the regression coefficients are presented in Table 4.14 below;

Table 4.14 Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
1 (Constant)	15.680	1.659		9.450	.000
Operation of aircraft	.394	.234	.396	1.682	.001
Personnel licensing	.061	.138	.089	.444	.009
AOC and Administration	.113	.181	.133	.625	.004

a. Dependent Variable: Growth of the domestic airline industry

The resultant regression model is;

$$Y = 15.680 + .394X_1 + .061X_2 + .113X_3 + 1.659$$

The research further sought to examine the significance of the relationship between civil aviation regulations and growth of the domestic airline industry, the coefficients of the regression (β), the intercept of the model (α) and the significance of all the coefficients were subjected to further t-tests.

The test results in table 4.14 indicate a constant $\alpha = 15.680$ is significantly different from 0 since the p-value $.000 < .05$. The beta value (β) = $.394$ is significantly different from 0 since the p-value $.001 < .05$. This indicates that there is a statistically significant positive effect of operation of aircraft requirements on growth of domestic airline industry. A unit change in operation of aircraft requirements will result in a $.394$ unit change in the growth of domestic airline industry. Van Boekhold, Faghri, and Li, (2014) indicated that meeting operational efficiency requirements was key to the performance of domestic airlines. Adediran, (2016) indicated that operational requirements were positively related to uptake of domestic aviation services uptake.

The test results in table 4.14 indicate a constant $\alpha = 15.680$ is significantly different from 0 since the p-value $.000 < .05$. The beta value (β) = $.061$ is significantly different from 0 since the p-value $.001 < .05$. This indicates that there is a statistically significant positive effect of personnel licencing requirements on growth of domestic airline industry. A unit change in personnel licencing requirements will result in a $.061$ -unit change in the growth of domestic airline industry. Park, Lee, Kwon, and del Pobil, (2015) indicated that meeting licencing requirements among flight personnel enhanced the service uptake and customer satisfaction. Saranga and Nagpal, (2016) further noted that meeting regulatory requirements among the staff of the airline fostered the market performance.

The test results in table 4.14 indicate a constant $\alpha = 15.680$ is significantly different from 0 since the p-value $.000 < .05$. The beta value (β) = $.113$ is significantly different from 0 since the p-value $.001 < .05$. This indicates that there is a statistically significant positive effect of air operator requirements on growth of domestic airline industry. A unit change in air operator requirements will result in a .113-unit change in the growth of domestic airline industry. Meichsner, O'Connell, and Warnock-Smith (2018) concluded that for African airlines to meet all air operator requirements there is need to form alliances that will be a key driver to operational performance.



CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The fifth chapter of this study presents the discussions, conclusions and recommendations of the research. The chapter is arranged in line with the objectives of the study as presented in the data analysis outlined in chapter 4.

5.2 Discussion

The findings of the research were in line with the tenets of the configuration theory that points out that environmental dimension's configuration have an impact on the organization performance. The theory holds that a fit within the operational strategies and combination of different regulatory frameworks will result in better firm performance. The results of the study have indicated that civil regulations within the airline industry have resulted in better organization performance for domestic airlines. This study thus contributes to the available knowledge on the applicability of configuration theory in examining impact of regulations.

5.2.1 Operation of Aircraft Regulations and Growth of Domestic Airline Industry

The first objective of the research sought to examine the effect of operation of aircraft requirements on the growth of the domestic airline industry. The results of the research indicated that a majority of the domestic airlines adhered to the operation of aircraft requirements sets by the regulator. The operators met the maintenance requirements, had adequate passenger handling capabilities and met the flight crew requirements. The results indicated that there was a moderately positive and significant effect of operation of aircraft requirements on the growth of the domestic airline industry $p = .434$, $sig = .001 < .05$. The results are consistent with Mallikarjun (2015) who in his

examination concluded that having effective operation requirements was key to strengthening domestic airlines. Carlucci, Cirà, and Coccorese, (2018) similarly concluded that adherence to operational regulations fostered the technical and scale efficiency within airports positively.

5.2.2 Personnel Licencing Requirements and Growth of Domestic Airline Industry

The second objective of the study examined the effect of personnel licencing requirements on the growth of the domestic airline industry. Findings of the study indicated that most of the personnel working within the domestic airline industry were licenced with the flight crew members being adequately certified within the industry. Karatepe and Vatankhah, (2015) indicated that staff development, enhancement and licencing was key to fostering a high-performance work environment. Results further showed that the personnel in the industry routinely undergo training and testing and meet the international rating standards. The results of the research indicated that there was a weak positive and significant effect of personnel licencing requirements on the growth of the domestic airline industry $p = .317$, $sig = .014 < .05$. Low and Yang, (2018) are of the same view that fostering the operation, licencing and airworthiness of the pilot and flight crew positively enhanced the performance of the airline.

5.2.3 Air Operator and Administration Requirements and Growth of Domestic Airline Industry

The third objective of the study sought to determine the effect of air operator certification and administration requirements on the domestic airline industry's growth. Study findings indicated that some of the air operators have met the certification requirements and adhere to the aviation security requirements. Results obtained also indicated that not all the airlines meet the safety requirements for cargo

and passenger as well as maintenance. The results of the research indicated that there was a weak positive and significant effect of air operator and administration requirements on the growth of the domestic airline industry $p= .389$, $sig= .002 < .05$. The results are in agreement with Chang, Shao, and Chen, (2015) who posited that compliance to ICAP safety management systems enhanced the efficiency and performance of the airport. Irandu, (2018) also viewed adherence to air operation regulations as a key contributor to the positive growth of the domestic airline industry.

5.2.4 RPAS Regulations and Growth of Domestic Airline Industry

Finally, the study reviewed the effect of the RPAS regulations on the industry and the consensus among the respondents was that having reasonable regulations in this area will open it up and provide new commercial options which would in turn enhance the growth of the sector. The respondents further pointed out that poor public awareness, high investment costs, security concerns and stringent regulations may limit the operation of drones in the country. These results are consistent with Jones, (2017) who indicated that the drone regulations in the country were too stringent thus curtailing the growth of the overall domestic airline industry.

Additionally, the respondents indicated the need for the government to come up with an appropriate taxation policy, offer incentives as well as expand the available aviation infrastructure in order to foster the growth of the domestic airline industry. These results are consistent with Wanjala, (2015) who projected that licencing of drone technology within the country would herald a new frontier in the aviation industry commercialization.

5.3 Conclusions

The research sought to examine the effect of civil aviation regulations on the growth of the domestic airline industry. The results of the study indicated that there was positive effect between the regulations and growth of the industry. The study concludes that operation of aircraft regulations, personnel licencing regulations and air operator certification and administration regulations account for 19.6% ($R^2=.196$) variations in the growth of the domestic airline industry.

5.3.1 Operation of Aircraft Regulations

The study concludes that there is a positive effect of operation of aircraft requirements on the growth of the domestic airline industry. A unit change in operation of aircraft requirements will result in a .394 unit change in the growth of domestic airline industry. The study further concludes that meeting the maintenance requirements, operation requirements and passenger handling capabilities has been key to the growth of domestic airline industry.

5.3.2 Personnel Licencing Requirements

The research concludes that personnel licencing requirements have a positive effect on the growth of the domestic airline industry. The availability of licenced personnel and certified flight crew members has supported the growth in the domestic airline industry. Additionally, as a result of local air operators meeting international standards and their crew passing routine tests the industry has generally experienced growth. A unit change in personnel licencing requirements will result in a .061 unit change in the growth of the domestic airline industry.

5.3.3 Air Operator Certification and Administration Regulations

The study concludes that meeting air operator and administration requirements is integral to the growth of the domestic airline industry. A unit change in air operator certification and administration requirements will result in a .113 unit change in the growth of domestic airline industry. The research further highlights that the ability of domestic airline firms to meet certification, aviation security and maintenance requirements is central to the positive growth that has been achieved within the sector.

5.4 Recommendations

The study recommends that aviation firms should invest in additional cargo and passenger handling infrastructure that will expand their capacity which can be leveraged upon to increase the level of traffic. The study further recommends that domestic airline firms should invest in newer aircraft fleet as this will decrease their maintenance and operational costs which in turn would boost their revenue and foster efficient service provision.

With regards to personnel licencing requirements, the study recommends that domestic airlines should expand their recruitment of competent and certified personnel as this will enhance their growth. Further the study recommends that domestic airlines should conduct more rigorous and frequent route and base check trainings as well as refresher programmes for their flight crew members as this will enhance their operational efficiency, competence, safety and customer satisfaction levels.

Concerning the air operator certification and administration requirements, the research recommends that domestic airlines should formulate a comprehensive safety, quality and security department that meets the regulatory requirements of KCAA and work towards having systems and that are at par with international best practice.

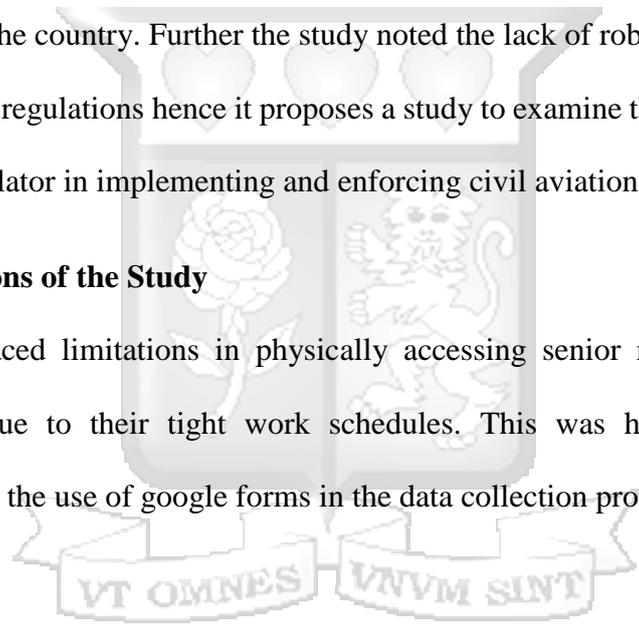
Finally, with regards to RPAS regulations the study recommends that more should be done to accommodate not only the public views but also other stakeholders input in the design of the regulations in order to foster commercialization and operationalization of this sub sector.

5.5 Areas for Further Research

Despite being an aviation and financial hub for the region, the country has lagged behind in the commercialization of unmanned aerial vehicles. The current research proposes an exploratory study to map the economic potential and drivers of utilization of drones in the country. Further the study noted the lack of robust implementation of civil aviation regulations hence it proposes a study to examine the effectiveness of the industry regulator in implementing and enforcing civil aviation regulations.

5.6 Limitations of the Study

The study faced limitations in physically accessing senior management in some companies due to their tight work schedules. This was however mitigated by incorporating the use of google forms in the data collection process.



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APPENDICES

Appendix I: Questionnaire

Kindly in the below statements tick on the appropriate box that corresponds to the response meant for each of the categories.

PART A: GENERAL INFORMATION

1) Gender

Male

Female

2) Age Bracket

Below 30 years

31– 40 years

41 – 50 years

51 and above

3) Education Level

O- Level

Diploma

Graduate

Post-Graduate

4) How long have you worked within the domestic airline industry?

1-3 years ()

4-6 years ()

7-9 years ()

5) What is your job category within the domestic airline?

Chief Finance Officer ()

Operations Manager ()

PART B: EFFECT OF CIVIL AVIATION REGULATIONS ON THE GROWTH OF THE DOMESTIC AIRLINE INDUSTRY IN KENYA

Please tick the level of agreement on the following statements. Please indicate in the table with a tick (√) or a cross (×) with a scale of;

5= strongly agree 4= Agree 3= Disagree 2= Strongly Disagree 1= Neither Agree nor Disagree

No	Growth of the domestic airline industry	1	2	3	4	5
1.	There is an increase in the growth of operators within the domestic airline industry					
2.	There is growth in the level of air traffic within the country					
3.	There is increased adoption of new technologies within the domestic airline industry					
4.	There is increase in number of aircrafts among domestic aviation firms					
5.	There is increase in the cargo movement within the domestic airline industry					

5). From your own experience within the domestic airline industry what other key metrics are utilized in measuring the growth within the domestic airline industry?

.....

.....

.....

No	Operation of aircraft and Growth of domestic airline industry	1	2	3	4	5
1.	Domestic airlines adhere to the operation requirements set by the regulator					
2.	Domestic airline players meet the maintenance requirements sent by the regulator					
3.	There are adequate passenger handling by domestic airline firms					
4.	Domestic airline firms meet the flight crew requirements set by the regulator					

6) Based on your own understanding of the operation of aircraft what other key policies have affected the growth of the domestic airline industry?

.....

.....

.....

No	Personnel licencing and Growth of domestic airline industry	1	2	3	4	5
1.	Personnel within the domestic airline industry are all licenced					
2.	Crew members within the domestic airline industry firms are all certified					
3.	Personnel within the domestic airline industry undergo routine training					
4.	The personnel within the domestic airline industry have met international rating standards					
5.	Flight crew operators within the domestic airline industry undergo routine testing					

7) From your own understanding of the procedures within the domestic airline industry, in what other ways do personnel licencing affect growth of the industry?

.....

No	Air operator and administration and the Growth of domestic airline industry	1	2	3	4	5
1.	Domestic air operators have met the certification requirements.					
2.	Domestic air operators meet flight operations requirements					
3.	Domestic air operators adhere to security management requirements					
4.	Domestic air operators meet safety requirements in handling of cargo and passenger traffic					
5.	Air operator administrators meet the maintenance requirements					

8) Based on your practice experience in what other ways does the air operator certification and administration requirements foster the growth of the domestic airline firms?

.....

Part C: RPAS REGULATIONS IN KENYA

9) From your knowledge of the domestic airline industry; how will the anticipated regulations of unmanned aerial vehicles affect the growth of the industry?

.....
.....
.....
.....
.....

10) Based on your practice experience what could pose limitations to the effective inclusion and operation of RPAS within the domestic airline firms?

.....
.....
.....
.....

11) What have been the main challenges affecting the growth of the domestic airline industry?

.....
.....
.....

12) From your own experience what possible policy recommendations would you present to enhance the growth of the domestic airline industry?

.....
.....
.....
.....

Appendix II: Kenya Aviation Industry Analysis

JKIA Airline Industry Analysis

Year	Arriving	Departing	Aircraft Movement
2014	3,284,319	3,293,191	50,255
2015	3,343,193	3,341,032	49,706
2016	3,629,096	3,603,682	54,603
2017	3,698,847	3,612,195	54,676
2018	4,078,080	4,075,234	57,321

Kenyan Domestic Airline Industry Analysis Jul 2017-Jul 2018

Hub	Aircraft Movement	Passenger Numbers	Amount of Cargo
JKIA	5.8%	6.0%	-16.3%
Moi International Airport	16.1%	2.8%	-25.5%
Eldoret International Airport	9.5%	-1.5%	-8.9%
Wilson Airport	-4.8%	40.6%	14.9%
Kisumu International Airport	37.6%	24.1%	-
Malindi Airport	45.5%	7.1%	-
Lokichoggio Airport	-8.9%	-26.4%	-
Wajir Airport	-10.1%	38%	-
Manda Airstrip	18.7%	31.6%	-
Ukunda Airstrip	18.6%	47.5%	-
Isiolo Airport	-34.4%	-77.1%	-
Other airstrips	-39.6%	-30.7%	-
Total % Change	2.9%	8.6%	-16%

Source: KAA Air Traffic Analysis 2018

Appendix III: Ethical Approval



1st April 2019

Edward Pitya Jumi
P.O. Box 55773 – 00200,
Nairobi,
Edward.jumi@renegadeair.co.ke

Dear Edward,

REF **Protocol ID:** SU-IERC0313/19 **Student no:** 99728

Effect of civil aviation regulations on the growth of the aviation industry in Kenya

We acknowledge receipt of your application documents to the Strathmore University Institutional Ethics Review Committee (SU-IERC) which includes:

1. Study Protocol submitted 24 March 2019
2. Cover letter listing all submitted documents 24 March 2019
3. Proposal declaration page signed by supervisors 24 March 2019

The committee has reviewed your application, and your study "Effect of civil aviation regulations on the growth of the aviation industry in Kenya." has been granted approval.

This approval is valid for one year beginning **1st April 2019** until **1st April 2020**

In case the study extends beyond one year, you are required to seek an extension of the Ethics approval prior to its expiry. You are required to submit any proposed changes to this proposal to SU-IERC for review and approval prior to implementation of any change.

SU-IERC should be notified when your study is completed.

Thank you

Sincerely,

Prof. Florence Oloo
Secretary

Strathmore University Institutional Ethics Review Committee



Appendix IV: NACOSTI Research Authorization



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 3310571, 2219420
Fax: +254-20-318245, 318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/19/42060/28529**

Date: **12th March, 2019**

Edward Pitya Jumi
Strathmore University
P.O. Box 59857, 00200
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Effect of civil aviation regulations on the growth of the aviation industry in Kenya*" I am pleased to inform you that you have been authorized to undertake research in **Mombasa and Nairobi Counties** for the period ending **12th March, 2020**.

You are advised to report to **the County Commissioners and the County Directors of Education, Mombasa and Nairobi Counties** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.


GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Mombasa County.

The County Director of Education
Mombasa County.