FACTORS AFFECTING THE BUSINESS OF PAKISTAN INTERNATIONAL AIRLINES (PIA)

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PIDE2019FMPHILEAF31

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2021**

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CERTIFICATE

This is to certify that this thesis entitled: **"Factors Affecting the Business of Pakistan International Airlines(PIA)"** submitted by **Mr. Ihsan Ullah** is accepted in its present form by the PIDE School of Economics, Pakistan Institute of Development Economics (PIDE), Islamabad as satisfying the requirements for partial fulfillment of the degree in Master of Philosophy in Economics and Finance.

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Author's Declaration

I, Ihsan Ullah, hereby state that my M.Phil. thesis titled "**Factors Affecting the Business of Pakistan International Airlines (PIA)"** is my own work and has not been submitted previously by me for taking any degree from the Pakistan Institute of Development Economics (PIDE) or anywhere else in the country/world.

At any time, if my statement is found to be incorrect, even after my Graduation, the university has the right to withdraw my M.Phil. Degree.

Date: _____   Signature of Student

                                                             Ihsan Ullah

Dedication

"My Humble Effort Is Dedicated to My Beloved Parents, Mr And Mrs Alaf Khan, Brother and Sisters for Their Loving Wishes, Support, Patience and Gaudiness, and All Those Seek Knowledge to Reach Truth".

ACKNOWLEDGEMENTS

ABSTRACT

Despite covering a large share of Pakistan aviation industry Pakistan International Airlines Corporation (PIAC) is facing financial crises and losses for a few years and the government is subsidizing it every year about Rs 456 billion. This study examined the different factors which affect the business of Pakistan International Airlines Corporation (PIAC). We disaggregate the business into operating revenue and operating cost to examine the separate effect on the PIA business. The factors which affect operating revenue (OR) are revenue passenger (RP), revenue passenger carried (RPC), revenue load factor KM (RLFKm) and revenue hour flown (RHF) Revenue ton KM (RTKm), and operating expenses (OE) are affected by PIA fleet number of plane (NOP), available seats (AS), routs Km (RKm), passenger load factor (PLF) and available ton Km (AtKm) and The empirical analysis is based on Autoregressive distributed lag (ARDL) co-integration approach from the period 2000-18. Empirical results and the study suggest that the main factors of low operating revenue, revenue passenger is low, non-feasibility of majors routs, low revenue per aircraft and high operating expenses due to high seat availability, passenger load factor due to which Pakistan International Airlines Operating expenses are greater than operating revenue. On the basis of results of operating reveune to increase Opreating reveune Pakistan International Airlines should increase revenue hour flown by reducing input like the staff of the Airlines. to increase the revenue load factor PIA, need a mass of passenger which is very low by providing good services and low fare compared to other Airlines, to increase RPC PIA should start flights based on geographic location, all these can increase the operating revenue of PIA. To reduce the operating Cost, to increase the chances of availability of seats is depending on fares and the fare of PIA is almost the same to market. PIA management should focus on services on the same fare or reduce the low fare to increase the seat availability and an increase in seat availability will reduce the operating cost. ATK is very low, PIA needs to stop operating non-profitable routes and these routes should be operating by intra-Airlines agreement to increase ATK, all these will reduce expenses of PIA.

Key Words: PIA, Operating Revenue, Operating Cost, Airlines

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List of Abbreviations

ADF	Augmented Ducky Fuller
AEP	Average Employee Productivity
AIC	Akaike Information Criteria
AVM	Air Voice Marshal
CAA	Civil Aviation Authority
DEA	Data Envelop Analysis
ECM	Error Correction Model
GDP	Gross Domestic Product
HBL	Habib Bank Limited
LCC	Low Cost Carrier
PAF	Pakistan Air Force
PARCO	Pak Arab Refinery Limited
PEC	Pakistan Engineering Council
PIA	Pakistan International Airlines
PPL	Pakistan Petroleum Limited
PSM	Pakistan Steel Mills
SBC	Schwartz Bayesian Criteria
SOE	State Owned Enterprises
TFP	Total Factor Productivity
TSA	Transport Security Administration
US	United States
WATS	World Air Transport Statistics
β	Beta

Chapter 1

INTRODUCTION

1.1 Background

Today the world has a competitive environment that demands that corporations and organizations especially state-owned enterprises perform efficiently. The critical way to enhance the performance is realizing what and how to appraise. Appraise therefore is the main factor to refine endeavors and especially to the buildup of short term and long-run decisions making. For this purpose, a large number of organizations are trying and conducting research to pin down main and important factors which bestow to poor performance or the success not limited to their own corporation/organization but also other organization of the industry with aim of guideline in case of success and circumvent the same fallacy by hesitating the supremacy of such deterioration factors in case of poor performance.

The main focus of the current study is to identify factors that may contribute to poor performance. The case study of Pakistan international Airlines has been selected to investigate due to poor performance of the corporation from past few years. Pakistan international Airlines is now suffering losses but it has the capacity of earning profit and can contribute to the economy of Pakistan. Pakistan International Airlines was established in 1956 as a solely national flag carrier. The services provided by Pakistan international Airlines include transportation services, cargo, and courier services. Pakistan international Airlines also operate in domestic as well as international markets. In the domestic market, it covers the area where other Airlines does not

fly, while in the international market, due to a large number of airlines and lower fare, as compared to Pakistan International Airlines, it faces competition.

State-owned airlines play an important role in the economy of the country. Before the existence of Pakistan international Airlines, Orient airways was operating, which was a privately owned company with limited capital and resources. It was not possible to expand and grow independently, and the Government of Pakistan decided to invite orient airways to merge orient airways accepted it and became a new airline named Pakistan International Airlines Corporation. Pakistan International Airlines Corporation ordinance was passed on 10 January 1955, This year, Pakistan International Airlines started international flights. Now it is under the civil aviation secretary. Karachi airport is the central hub, while Islamabad and Lahore airports serve as secondary hubs.

Pakistan International Airlines Corporation is one of the largest airlines in Pakistan, with more than 30 operating aircraft. Pakistan International Airlines operates 100 flights daily, of which 18 are domestic, and 25 are international destinations, including Europe, America, Asia, and the middle east. Pakistan International Airlines Corporation also owns two hotels: one is in New York- the resolute hotel, and the other is the Sofitel Paris scribe hotel in Paris. The majority of the Pakistan International Airlines Corporation share (86%) are owned by the Government of Pakistan, and the remaining 14% are by private shareholders. Pakistan International Airlines Corporation is managed and controlled by the president and Chief executive officer, plus the board of directors.

In 2011 Pakistan International Airlines started losses and needed Government subsidies due to competition. Pakistan International Airlines increased fair prices, corporate mismanagement, and overstaffing led to shrinking revenue. According to a report in 2016, there was a $3 Billion loss. In 2018 it reached $3.3 billion, which needed Government support for Operations. In 2019, Pakistan International Airlines (PIA) claimed that revenue is equal to operating costs. According to an audit report of 2019, there were 46 empty flights between 2016-17. Due to this, Pakistan International Airlines lost $1.1 million. At the end of 2019, the revenue of Pakistan International Airlines increased by 41% due to a cut in non-profitable routes and an increase in the utilization of airline cargo space.

1.2 Importance of Pakistan International Airlines Corporation to the Economy

The National Airlines of any Country play a crucial role in the Economy. Pakistan International Airlines, especially air transport, plays an important role in moving the Economy of Pakistan because it provides Jobs about 500000, contributes to the Gross Domestic Product (GDP) by 1%, to bring foreign tourists by air to Pakistan. Air transport also facilitates the flow of goods and investment and peoples, air transport connect the cities of Pakistan and consumers and the wider economy get the benefits of fast connections. It is the major source of air transport for people from one place to another around the world. The cargo service is also working for itself, the nation, and the economy. The major task of the government is to support its own state enterprises, which are the backbone of the economy. Many action plans were taken to make Pakistan International Airlines stand on foot. The main objectives of the plans were to facilitate Pakistan International Airlines due to loss which is a burden on the economy. According to a

report (2021) of world Airlines ranking by customer vote, Pakistan International is not top 100 Airlines[1]. Currently, Pakistan International Airlines' financial health is not good, and it needs immediate reforms because it doesn't contribute to the economy like other countries' national Airlines are doing but contrastingly, it is a burden on economy[2]. According to a report released on December 31, 2019, Pakistan International Airlines reported a net loss of Rs56.03 billion for the year compared to the loss of Rs 43.98 billion in 2018, which is financed by the Government. According to an audit report published in the "The NEWS' on Oct, 15 Pakistan steel mills and Pakistan international Airlines are suffered RS 552 billion in 10 years in which 361 billons was contributed by Pakistan International Airlines[3]. By summarizing the above discussion, Pakistan International Airlines is contributed as a few decades ago and also like other countries' nationals Airlines. Pakistan Airlines is one of its own state enterprises which are considered the backbone of the economy so it needs special attention and needs reforms, policies, etc., to make great it again and at least should not be a burden on Pakistan's economy.

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[1] https://www.worldairlineawards.com/worlds-top-100-airlines-2021/

[2] https://www.thenews.com.pk/print/476743-the-pia-burden

[3] https://www.thenews.com.pk/print/398206-pia-psm-suffer-rs552-bn-loss-in-10-years-audit-reveals

1.3 Research Gap

The existing literature explored the reasons for customer satisfaction, service quality, performance, empirical analysis, etc. It is obvious that all constraints discussed by existing literature have much importance, but there is a need to point out further important factors that affect the performance of Pakistan international Airlines and its cause of losses. The evidence for this need

can be observed in the significant gap between the revenue and expenses of Pakistan the international Airlines that currently persists, as supported by facts and figures. This study considered unexplored factors affecting the revenue and cost like a passenger, revenue passenger carried, revenue load factor KM, revenue hour flown, PIA fleet number of the plane, available seats, routs km, passenger load factor, and available ton kilometre.

1.4 Research Problem

Pakistan International Airlines(PIA) has been Facing financial crises and losses for Few Years, and Government is Subsidizing It Every Year for About Rs 45 Billion[4] due to the poor performance of the organization during the past few years. It is now suffering losses, but it can earn profit and contribute towards the Gross Domestic Product (GDP) of the country. This study

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[4] https://www.dawn.com/news/1646640

tries to explore all possible determinants or Factors which are contributing to the expenditure and revenue of Pakistan International Airlines (PIA), along with other factors too which affect the performance. This study considered many factors which are unexplored by existing literature. This study will explore all these factors which are not discussed by existing literature. According to Baloch et.al (2017), the level of service quality provided by Pakistan international Airlines(PIA) is average. Another literature by Saleem et al. (2017) in which they studied the service quality and repurchase intention of Pakistan International Airlines. They found that service quality and trust play important roles in any business. This study incorporates the factors of operating expenses like available seats (AS), Rout kilometres, (RKMs), passenger load factors (PLF), available tonne(AT), and Number of fleet and factors of operating revenue like Revenue passenger (RP), Revenue passenger (RPC), revenue load factors(RLF), and revenue kilometer flown (RKF). Revenue tonne (RT) and revenue hour flown (RHF).

1.5 Problem Statement:

Pakistan International Airlines has been facing financial crises and losses for a few years, and the government is subsidizing it every year for about Rs 450 million. The existing literature is not found the factors which are affecting the business of Pakistan international Airlines. So there far this study will cover all the factors behind the high operating expenses and low operating revenue of Pakistan international Airlines and will suggest a possible solution.

1.6 Research Objective

This Study has empirically considered unexplored factors affecting the revenue and costs like a passenger, revenue passenger carried, revenue load factor KM, revenue hour flown, PIA fleet number of the plane, available seats, routs km, passenger load factor, and available ton-km. This study will also consider some factors and comparative analysis with some selected Airlines and main challenges like aviation policy, liquidity, demotivated workforce, open sky policy, undisciplined environment, and financial drawbacks of Pakistan International Airlines.

The revenue of Pakistan International Airlines has been less than the cost for a few years, and Pakistan International Airlines is going in losses of about Rs 500bn[5]. The current literature tries to identify all those factors that play an important role in the revenue and expenditure of Pakistan International Airlines. The current study has provided the operational profit analysis of Pakistan, also called profit operational analysis. Pakistan International Airlines (PIA) based on which Recommendation for Pakistan International Airlines we will be decided.

The objectives of this study are

- To Identify the Factors That Can Maximize the Probability of Revenue and Reduce the Burden of Pakistan International Airlines On the Government /Economy.

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[5] https://tribune.com.pk/story/2281881/pia-incurred-rs500b-losses-in-15-years-na-told

- To investigate the factors that determine the revenue and cost of Pakistan international Airlines at different stages.

1.7 Research Questions

- What are the main causes of losses of Pakistan International Airlines?
- How we can make Pakistan International Airlines Profitable?

1.8 Significance of the Study

State-owned enterprises play a vital role in a country development and growth, but misfortunately in developing economies, especially in Pakistan majority of the State-owned enterprises which are considered the backbone of the economy, are not only loss-making but it is a burden on the economy and government financing for operation. Pakistan international Airlines is one of them.

None of the studies regarding Pakistan have analyzed the factors which affect the Business of Pakistan International Airlines also literature is not available on comparative analysis and main issues faced by Pakistan international Airlines. This study is completely different from the available literature on Pakistan international Airlines (PIA). First, we disaggregate business into operating revenue and operating expenses. Second, we also investigate the main issue faced by PIA and also comparative analysis with some international Airlines like employee, corruption, political interferences, etc.

This study helps to guide which reforms and policies are required for Pakistan International Airlines that can reduce the loss and increase revenue. If we solve the problem of Pakistan International Airlines, the main Economic impact will be that it will reduce the burden of public financing, which can lead to the reduction of deficit financing. Society will also observe the impact when government spending allocated subsidies on health, education etc.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature to explore all the possible factors which are determining the operating expenses and operating revenue of an airline. So, this chapter explains very briefly the factors reconnoitre by different studies, the main factors of losses of Airlines and also about privatization of Airlines. The literature review helps us to identify the research gap and explain in brief the objectives of the study discussed in previous studies.

2.2 Literature Review:

The Financial performance of Pakistan International Airlines is weak. According to Lin (2012), Pakistan international Airlines scored 0.84 value. Pakistan International Airlines (PIA) can reduce about 26% inputs with zero percent reduction in output, further more operating revenue from passenger services, international percentage of operation, operation focus, indirect cost, and the fixed asset has effected the efficiency positively while the specialization in serving international and passenger markets exert have a negative effect. Pakistan International Airlines is operating in the international market it has strengths, weaknesses, opportunities in the world market, and threats from competition. (Selase, 2018) finds that Overall the financial and service performance of Pakistan International Airlines is not satisfactory. The study suggests that Pakistan International Airlines can be the market leader if they save current market share, extend

the market, to expand market share, improve the customer service quality, food quality, cooperation with passenger and need to revise ticket prices. In Pakistan several private Airlines are operating flights directly.   Berry and Jia (2010) analyzed the United States Airlines industry empirically. They find the problem of the industry and estimate the impact of demand and supply change on profitability. They conclude that with a comparison with the 1990s, the demand for air travel was more sensitive in 2006. The preferences of the passengers were towards direct flights. Additionally, the changes in marginal cost were in favor of direct flights. At last, they recommend that to increase profit the Airlines should focus on direct flights and changes in demand because changes in demands and cost also relate to changes in the network. They should give less attention to hub airports with more on a large number of direct flights.

Productivity is one of the main issues of Pakistan international Airlines. Ahmad and Khan (2011) analyzed the productivity of some Asian Airlines industry including Pakistan International Airlines. They reached to decision that specifically, Pakistan International Airlines in the short-run can cut down the seating capacity. The data also show that Pakistan International Airlines has better performance in terms of available ton kilometer (ATK) Than Sri Lankan Airlines while worse in terms of average employee productivity(AEP). They conclude that the Airlines industry plays important role in the high growth of the economy. The study recommends that Pakistan International Airlines need to focus to increase the average productivity, average length, and unit cost. In Pakistan, especially in government organizations, there is a lack of proper training, research, and development. Ahmed (2017) investigated the impact of organizational comment on employee turnover of Pakistan International Airlines. The factors behind lower

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turnover of employees are no or less support from the organization, non-availability of the training program, job satisfaction, and job autonomy. He suggests that individual must participate in training program and need more attention to job satisfaction. Organizations should support, need job autonomy and last there should be learning opportunities.

Pakistan aviation industry has very strict regulations. United States regulations are beneficial for the consumer and lead to reduced prices and inherent services. the regulations and liberalizations in Europe are unlikely to close in productivity gap between the United States and non-United States, firms till allowing carriers to increase the traffic density price and route freedom will play an important role. They recommend that Airlines especially those with low total factor productivity increase traffic density by decreasing fares and the government. must be delegalized and liberalized Pakistan International Airlines and the weak Airlines need merging otherwise they will be out from the market. (Windle 1991).

Most of the routes operated by Pakistan international Airlines are not profitable. Park and Zhang (2000) analyzed global Airlines alliance empirically in which they checked the impact of fair, passenger volume, and consumer surplus of four major Airlines. They concluded that Airlines alliance increases the aggregate demand on alliance routes and decrease the fair and also passenger volume.

Chapter 3

DECADE-WISE HISTORY AND PERFORMANCE OF PIA

3.1 Introduction

In this chapter, we will briefly discuss the decade-wise performance of Pakistan international Airlines (PIA), operating profit analysis, the role of Pakistan international Airlines (PIA) in deficit financing, and the main issues faced by Pakistan international Airlines (PIA).

3.2 Decade Wise History and Performance of PIA

3.2.1 Early years

Pakistan international Airlines origin can be Traced before the independence of Pakistan. When the leader of the nation realizes that the national flag career needs time then Quaid e Azam Muhammad Ali Jinnah discuss with Muslim businessmen one was Adam Ji Haji Dawood and Mirza Ahmad Ispahani. As result, they registered the first Muslim-owned Airlines name is orient airways in the British raj on Oct 23, 1946. And the Airlines started flight on June 30, 1947.

After independence it start relief operations for the nation and the task of the main service was between west and east Pakistan. By 1949 orient airways acquired three services from Karachi, Delhi Calcutta Dhaka routes and become the first Asian Airlines to operate Convair aircraft.

3.2.2 The 1950s

In 1950 the traffic of Orient Airways was courteously declined and the route between east and west Pakistan was given to British Airlines and also two local competitors enter the market. The result orient airways were faced losses and through the 1952 contract government of Pakistan was subsidizing its operation and for the purchase of three super constellations, the government of Pakistan established a new subsidiary at the cost of Rs 25 million named Pakistan International Airlines (PIA). The civil aviation authority (CAA) was established as a department of Pakistan International Airlines (PIA) With the objective of maintenance and operation.

The government of Pakistan established Pakistan International Airlines (PIA) through the merger of Orient Airways in 1953. In which they will operate is joint, the financial control will be under Pakistan international Airlines and ground assets and operations will be under the control of orient airways. On March 11, 1955 orient airways merged and parts of Pakistan international Airlines corporation under the ordnance of 1955. The Airlines also added two new routes Karachi-Quetta-Lahore and Lahore-Quetta- Karachi. The passenger-carrying capacity of Pakistan International Airlines (PIA) increased by 50% in 1955 as compared to 1954. The first International flight of Pakistan International Airlines (PIA) land in London Hathoro airport and in 1956 Pakistan International Airlines (PIA) ordered five new aircraft. In 1958-59 the number of passengers increased to 208000 and Air marshal Noor khan was managing director of Pakistan International Airlines (PIA) the era was known success of Pakistan international Airlines (PIA).

3.2.3   The 1960s

At the start of the 60s in February 1960 Pakistan International Airlines (PIA) leased a Boeing 707 from Pan American Airlines and introduced it on Karachi London routes and it was the first jet which is used for commercial purposes in the Asian region. An all-Pakistani crew began operation of the 707 from 20 June 1960 onwards. By the end of 1960, Pakistan International Airlines (PIA), for the first time, entered financial profitability. In 1961 the fleet was extended and ordered more than 3 Boeings. On January 2, 1962, Boeing 720B flown by captain Abdullah Baig from London to Karachi made a world record which is breakable to date on a speed of 938.78 km/h which is the highest speed by commercial Airlines. On 29 April 1964 Pakistan International Airlines (PIA) start flights into China which was the first landing of non-communist in the communist country. After that also become non-Soviet which offer flights to Moscow.

In the 1965 war, Pakistan International Airlines (PIA) also provide services for transport and logistic services. The route of Pakistan International Airlines (PIA) grew in the 1960s. Paris, Istanbul, Baghdad, Kuwait, Jeddah, and Nairobi were started in 1966, while Bangkok, Manila, Tokyo, and Damascus were added in 1967 and 1969 respectively.

3.2.4 The 1970s

In 1970 government of Pakistan and Libyan signed an agreement to start Tripoli services 1972. PIA also signed an agreement to Yugoslav JAT to lease 2 Boeing to JAT. In 1974 Noor Khan was appointed Pakistan international Airlines (PIA) executive for the second time and Pakistan

international cargo services also started this year which offering freight and cargo services.in 1975 Pakistan International Airlines (PIA) also started uniform for an air hostess. after half of the decade in expansion in the fleet of Pakistan international Airlines (PIA) with Boeing 747 and two from air Portugal in 1976. In 1976-77 Pakistan international Airlines (PIA) crossed carrying two million passengers as compared to 1972-73 which were 6,98,000. And the revenue rose in 1976 as compared to 1975, the total Airlines revenue was $134 million from July to December of 1976.

In the 1970s decade, Pakistan international Airlines (PIA) also start assistance in technical and administrative or lease for the first time to the foreign Airlines in which air chine, air Malta, the Airlines of the Philippines, Somali Airlines, etc. were included. The subsidiary of Pakistan International Airlines (PIA) also started Hotel management services in the UAE. the political up and down the impact the operations of (PIA) negatively in this era.

3.2.5 The 1980s

The 80s decade was a growth decade for Pakistan International Airlines (PIA). In 1981 the total workforce of Pakistan international Airlines (PIA) was 24000 and in 1983 were reduced to 20000 which was also still high as compared to other Airlines. The operation of Pakistan International Airlines (PIA) Was decentralized because the responsibilities were split among the department. Despite decentralization Pakistan International Airlines (PIA) receive the highest ever profit in 1981-81 and also in1983-84. In 1984 Pakistan International Airlines (PIA) also started night service on the low-cost alternative for educational and observational purposes for

this purpose two more retired Boeings were added to this service. Pakistan international Airlines (PIA) also inaugurated the planetarium in Karachi which was also followed by Peshawar and Lahore. The profit of Pakistan international Airlines (PIA) also rose in 1984-85.

Pakistan international Airlines (PIA) also play important role in establishing emirates Airlines by providing technical and administrative assets in 1985 and also leasing aircraft. In 1987-88 the service to Mali, Toronto, and Manchester was also started.

3.2.6 The 1990s

In 1990 Pakistan International Airlines (PIA) start to sustain operating losses and liquidity crises due to pilot strikes issues with overstaffing, vendors, and political interference in the management of Pakistan international Airlines (PIA). In June 1991 Pakistan International Airlines (PIA) Add more six aircraft and also start to flight Tashkent 1992 and in June 1993 also to Zurich. In 1993 Air vice-marshal(AVM) Farooq Umar become managing director of Pakistan international Airlines (PIA) and permission was granted to 12 private Airlines domestically and open sky agreement was signed between Dubai and Karachi due to which competitions increased and financially burden on Pakistan international Airlines (PIA) and both decisions were taken simultaneously. In this decade Pakistan International Airlines (PIA) also started six new routes to CIS Countries and also to the Persian Gulf and also to support tourism in northern areas Pakistan International Airlines (PIA) started air safari in 1994. Furthermore, Pakistan International Airlines (PIA) also started non-stop flights from Islamabad and Lahore to JFK and Canada and

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in 1994 also added routes of Jakarta, Baku, Al-Ain, and Fujairah. In 1999 to replace old Boeings five more Boeings 747 were leased.

3.2.7 The 2000s

In 2001 Afghan war negatively affect the Pakistan international Airlines (PIA). because the Afghan air space was closed. However, in April 2001 the new management imposed some restrictions due to which the cost per employee decreased 24% in 2002-03, which lead to lower maintenance cost and increased revenue and the Airlines become profitable again. In July 2002 Pakistan International Airlines (PIA) Purchased six 747 Boeing for the purpose to start North American and European routes in which 5 were on lease and in October 2002 PIA also purchased 8 new Boeing 777 and later on also lease new Boeing.

In July 2006 a Pakistan international Airlines (PIA) crashed due to which Europe banned the flying of an Airlines except 9 Airlines out of 42 and the reason was that PIA has 20 years old Airlines. On 29 November 2007, the EU completely removed the ban, and PIA's entire fleet was permitted to fly to Europe.

3.2.8 The 2010s

In 2010, Pakistan International Airlines (PIA) altered its livery. By 2011 the bad era of Pakistan international Airlines (PIA) started and made losses and need government subsidies. And competition from middle eastern Airlines increased in fuel prices, mismanagement, and overstaff

led to a decrease the revenue. In 2014 Pakistan International Airlines (PIA) leased 4 more Boeing and also issued a request tender of 4 Boeing but misfortunately it was not accepted.

At the start of 2016 Pakistan International Airlines (PIA) employees walked out against the privatization of Pakistan International Airlines (PIA)and two employees died for the entire week Pakistan International Airlines (PIA) was grounded and did not operate. In August 2016 Pakistan International Airlines (PIA) started a new premier service to London on airbus A330-300 which was leased from Sri Lankan Airlines for six months. After six months this service end. At the end of 2016, the total debt of the Airlines was \$3 billion.

In 2017, the reservation and ticket system of Pakistan International Airlines (PIA) was replaced with the collaboration of the Turkish origin system known as Hitit, and the agreement was signed in 2018, and the system of Pakistan International Airlines (PIA) was transferred to the new system. By the end of 2018, the total debt of Pakistan International Airlines (PIA) was \$3.3 billion, and Pakistan International Airlines (PIA) and its needed government support for the operations. With the demise of Shaheen Air, Pakistan International Airlines (PIA) launched routes that had previously been served only by Shaheen Airlines. In 2019, new rational routes were started and frequency from Karachi to Toronto increased, and also six routes that were going in losses were shut down. Pakistan International Airlines(PIA) claimed that cost and revenue almost are the same. United States (US) based agency official of transportation security administration (TSA) to Islamabad airport authority told that permission of non-stop flight to united states (US) will be given soon.

In August 2019, Pakistan International Airlines(PIA) laid off about 1000 employees to reduce the burden. In September Pakistan International Airlines (PIA) said that they will increase fleet up to 37 by 2020 and 45 by 2023. According to Pakistan International Airlines (PIA) report the revenue increased by 41% due to the closing of non-profitable routes, reintroduction of grounded aircraft, and efficiency in Airlines cargo service.

3.2.9 The 2020s

In the 1st quarter of 2020 world pandemic took place and the majority of countries restricts air travel due to which operation of Pakistan International Airlines (PIA) also resumed internationally which affect the revenue of Pakistan International Airlines (PIA) very badly. In November 2020 Pakistan International Airlines (PIA) shut down its courier arm and laid off 320 employees (PIA official). later on, in December 2020 Pakistan International Airlines (PIA) announced the shifting of half of the lay of an employee to the Pakistan Engineering Complex (PEC) Of Pakistan air force(PAF).

In June 2020 minister of aviation, Ghulam Sarwar khan told parliament that out of 860 he licenses of 262 pilots are spurious or fake the passed the exam and get certificates to set someone else in the exam. Pakistan International Airlines (PIA) grounded 150 pilots having bogus licenses and 7 pilots were terminated. After this statement, the Europe union safety agency (SAFA) banned the Airlines for six months due to failing several safety things. In July 2020 the United States (US) also banned Pakistan International Airlines (PIA) About certificates issues are fake. By that date, the United Kingdom (UK) also banned Pakistan International Airlines (PIA), and in

Malaysia and Vietnam Pakistani pilots were grounded temporally. On 16, July 2020 the united states federal aviation administration degrades safety level to category 2 due to which Pakistan International Airlines (PIA) can't start new service to the united states and codeshare with United States (US) Airlines.

Currently, Pakistan international Airlines wants to reduce staff burden and government of Pakistan giving golden hand to retired on the willingness and almost 200 employees accepted the offer. This decision will help the financial burden on Pakistan International Airlines (PIA).

According to Pakistan International Airlines Corporation first-quarter report of 2020, Pakistan International Airlines (PIA) recorded a total revenue net amount of Rs 36,442,959 which include passenger amount Rs 32,362,655; cargo Rs 1,050,111; excess baggage Rs 1, 80,05; charter service Rs 805,362; engineering service Rs 2.8 million handling and related service Rs 2.81 million mail Rs 37, 982 and other Rs 1,6.52 million, which has increased as compared to last year recorded at Rs 30.75 million. Whereas the cost of service recorded total cost Rs 22.99 million including salaries, wages and allowances Rs 3.57 million, welfare and social security cost Rs .426 million, retirement benefit Rs .73 million, compensated absence Rs 50,311, legal and professional charges Rs 6,058, store and spare council Rs .51 million, maintenance and overhaul Rs 4 million, flight equipment rental Rs .42 million, landing and handling Rs 5.7 million, passenger service Rs .99 million, crew layover Rs .58 million, staff training Rs 3,093, utilities Rs 7,550, communication Rs .65 million, rent rates and taxes Rs .18 million, printing and stationary Rs 46,676, depreciation Rs 3.95 million, insurance Rs .77 million, amortization of intangibles Rs 2,706, others Rs .19 million. The cost hasn't shown much difference as compared

to the previous year. In 2019 cost recorded Rs 2.1 million. As above mention, the total amount of revenue and cost is not equal to each other. The ratio of cost is higher than revenue. All over the world the public was traveling and using Airlines transportation. The business environment of Pakistan International Airlines (PIA) showed negligible growth in revenue while, the world was facing a pandemic. The cost amount is much higher as compared to revenue. Such an amount couldn't change the fortune of Pakistan International Airlines (PIA) in front of the international arena.

3.3 PIA and Public Financing

Pakistan International Airlines (PIA) poor performance is one of the causes of Pakistan's deficit financing. Instead of revenue generator Government. of Pakistan support it The privatization in Pakistan was started for a different objective. The state-owned enterprises were not working very well we're not contributing to economic development. In the start, it was decided to privatize 14 units which were in loss but later on it extended to another sector also. The main objective of privatization was to reduce the fiscal deficits and increase revenue. For this purpose, in 1991, 166 SOEs were solid out on Rs. 476 billons, in which 80% were turned out to Federal government., 4.5% for privatization process expenditure, 9.5% were too golden handshake, and 5% were returned to the company, the 80% used by federal but data is not available where it's used. According to an economic expert, the objective is not achieved and results are not satisfactory.

We can't check the impact of privatization on fiscal deficits due to the unavailability of clear data, but from data, we can observe that the fiscal deficit is reduced a little bit. This can be more reduced if the privatization process takes place fairly and doesn't sell the enterprises to the government. members, relatives, and friends. Second, the state-owned enterprises should be sold at market price, not below the market then fiscal deficits can be reduced more. Third, the govt. should privatize one corporation separately not a few corporations in one bid like previous government offer that if someone buys steel mills Pakistan international Airlines (PIA) will be given free.

Table 1.1 Profit/Losses of PIA

Year	Net income (Million)
2000	5155.00
2001	2205.00
2002	1873.00
2003	1208.00
2004	2307.00
2005	4412.00
2006	12763.00
2007	13309.00
2008	36139.00
2009	68,22.00
2010	20785.00
2011	26767.00
2012	33844.00
2013	44322.00
2014	34006.00
2015	34995.00
2016	45381.00
2017	44110.00
2018	48000.00
2019	52602.00
2020	34663.00
2021	25113.00

3.4 Operating Profit Analysis of PIA

Operating profit is the profit that is generated through the operation. Operating profit is sometimes called profit before interest and tax and it is calculated operating expenses minus operating expenses.

Table 3.2 Operating Profit Analysis

Year	Operating revenue (Million RS)	Operating Expenses (Million RS)	Operating Net profit
2000	39,228	42,033	(2,805.00)
2001	43,608	43,242	366.00
2002	43,674	38,097	5,577.00
2003	47,951	42,574	5,377.00
2004	57,786	55,872	1,914.00
2005	64,074	67,075	(3,001.00)
2006	70,587	69,164	1,423.00
2007	70,481	76,415	(5,934.00)
2008	88,863	120,499	(31,636.00)
2009	94,564	98,629	(4,065.00)
2010	107,532	106,811	721.00
2011	116,551	135,023	(18,472.00)
2012	112,130	133,930	(21,800.00)
2013	95,771	129,588	(33,817.00)
2014	99,519	114,944	(15,425.00)
2015	91,269	108,478	(17,209.00)

2016	88,998	121,863	(32,865.00)
2017	90,288	122,193	(31,905.00)
2018	100,051	170,447	(70,396.00)
Total Net value	1,522,925	1,796,877	(273,952.00)

Source: Pakistan Economic Survey 2000-19
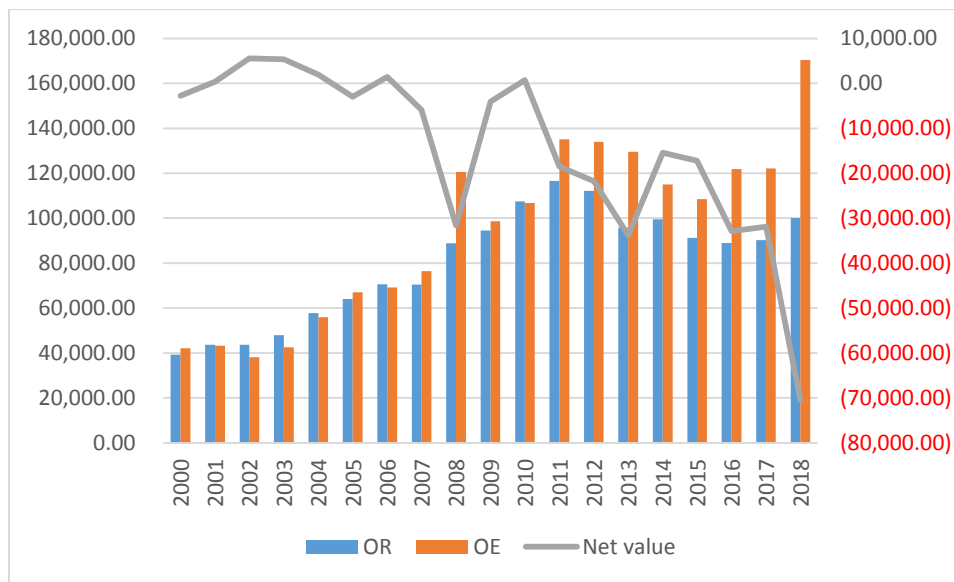
Figure 3.1 Operating Profit Analysis

Table 4 represents operating revenue and operating expenses and 3rd is the net profit from the year 2000-18. As we can observe from the table as well as from the graph that from the year 2000-04 the net profit was positive and also in 2006 and 2010 and the remaining years have negative net operating profit means that expenses were more than revenue due to which PIA is still bearing losses.

3.5 Aircraft and Employee of PIA Employee comparison with Some International Airlines

Pakistan International Airlines (PIA) is facing a shortage of revenue and is not recovering from the past few years. If we compare   Pakistan International Airlines (PIA) with other Airlines the performance of Pakistan International Airlines (PIA) is finically very poor, service providing, etc. the basic reason of losses of the Pakistan International Airlines (PIA) is staff overburden. In this analysis, we are comparing Pakistan International Airlines (PIA) with another international Airlines. Like Turkish Airlines, Qatar Airlines, Emirates Airlines, and Etihad airways.

3.5.1   Aircraft and Employee

According to Pakistan International Airlines (PIA) authority, their total of 29 aircraft and the employees are 14500 and on average aircraft, employees are 500 employees which are very huge. If we compare with other Airlines, Emirates Airlines has 269 aircraft and the employees are 62356, which per aircraft is 231, Turkish Airlines has 329 aircraft and employees are 31000 which is 94 per Airlines, the Qatar airways have 240 aircraft and employees are 46000 which is 191 employees per aircraft. Etihad Airways have 102 aircraft and the total number of employees are 21530 which is 211 employees per aircraft on average. On the other side, Pakistan International Airlines (PIA) has an average of 500 employees per aircraft. According to oxford, Analytica Pakistan International Airlines (PIA) has the highest employee to aircraft ratio in the world. In the below table we can observe the comparison of an Airlines[6].

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[6] https://nayadaur.tv/2021/04/why-pia-is-in-a-financial-crisis/

Table 3.3 Employee Comparison

Airlines	Number of Aircrafts	Average Employee per aircraft
Pakistan International Airlines	31	427
Emirates Airlines	269	231
Turkish Airlines	329	94
Qatar Airways	240	133
Etihad Airway	102	211

Source: Naya Daur April 25 ,2021

Number of aircraft and per aircraft average employee of PIA

Table 3.4 employee details year wise

Year	Number of planes	Number of Employees annual	Average employee per aircraft
2000	45	17,663	393
2001	45	17,170	382
2002	44	16,689	379
2003	43	18,517	431
2004	42	19,634	467
2005	42	19,263	459
2006	42	18,282	435
2007	39	18,149	465
2008	44	18,036	410
2009	42	17,944	427
2010	40	18,019	450
2011	40	18,014	450
2012	38	17,439	459

2013	38	16,604	437
2014	34	17,383	511
2015	34	16,271	479
2016	37	13,947	377
2017	36	13,268	369
2018	32	12,196	381
2019	30	11,740	391

Source: company financials

3.6 Main Challenges of PIA

Pakistan International Airlines (PIA) is facing different challenges which affect its performance. Following are some main issues faced by Pakistan international Airlines (PIA).

3.6.1 Pakistan Aviation Policy

The national aviation policy of Pakistan 15 (NAP-15), was formulated after 15 years. The aviation policy of Pakistan has been revised and reviewed mostly by irrelevant experts. the new aviation policy is effectively implemented. According to Mughni (2015), The results of the policy must favorably impact local, regional and global business entities and passengers traveling within, as well as to-and-from Pakistan. However, Pakistani state Airlines or private Airlines do not find the current acceptable Airlines policy. These conditions are crucial to the occasional success of the aviation industry in Pakistan. Lack of vision, inability to use modern management tools, and poor infrastructure, are some of the factors that address this situation. In contrast, many small and medium-sized countries, including a few in the region, are well-thought-out and underpinning their national development plans behind their powerful aviation sectors. Those who have set up their cards and done what they were supposed to do are reaping

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the fruits of their forward-looking policies. Others, like Pakistan, who have not been able to meet the demands of competition, continue to be left behind. The pace of growth in the region is now so rapid that in the next five years it would be difficult to find market leaders simply because of the high cost of investment, and the shortage of skilled workers.

3.6.2 Demotivated Workforce

Most employees have seen inconsistencies such as the persistence of senior staff members who are constantly changing (up to 7 to 8 changed already in 2011) and inconsistent work ethic since the introduction of PIA ultimately leading to disruptive workplace and illness. all and meet company strategies. Resources such as aircraft (currently require 32-50 breakeven), active Human Resources and internet access, cost control, and cash-generating tools are all in short supply making inefficiency very difficult, and overcoming business plans are in the process of being completed.

3.6.3 Open Skies Policy

Open sky means an agreement between two countries to allow any Airlines to fly from any of them without limiting the number of seats, price, and so on. In practice, there are always some limitations. In the 1990s the government of the Islamic Republic of Pakistan formally ratified the Open Skies Aviation Policy, signing a memorandum of understanding with several countries in the region and abroad. According to Deen (2007), These exercises were undertaken in great haste without really understanding the implications of "Open Skies" for Pakistan's carriers. PIA, which was at that time mainly dependent upon domestic and ethnic passenger traffic, suddenly

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found itself competing with outside carriers at home. The ensuing chaos led to a lot of information in the minds of misbehaving officials, the governing body, and the national administration. Each of them was keenly aware of the circle of his interests, with little understanding of the negative speculation of actions, or inaction, of the Pakistani aviation authorities as a whole, and the aviation industry in particular.

3.6.4 Undisciplined Environment

Challenges such as unspecified problems and organizational goals are barriers to many organizations causing the lack of creativity and efficiency needed to compete and perform well in today's world. New approaches to improving and increasing responsiveness and competitiveness are needed for firms that desperately need market growth. Our knowledge of the literature has increased with the main negotiated issues of competition, corruption, open-air policy, and the improper flow of international airports in Pakistan (PIA) currently facing them. Baloch, Jamshed, and Zaman (2014) studied that facilitating PIA administration in their efforts to rebuild their customer relationship thereby repositioning the Airlines in its strategic group. Pakistan International Airlines (PIA) is separated from rivals such as the Emirates and Qatar Airways in the sense of its national flag-bearing name, its open-air policy, and the country's economic collapse which slows the Airlines to growth and prosperity Due to shortages and losses, Pakistan International Airlines (PIA) has not yet been able to make the profits that take the Airlines away from negative cash flow on non-existent shares and very large debts.

3.6.5 Financial Drawbacks

The Treasury Department has major root problems, appropriately divided: Hotels, loan guarantee, Equipment replacement policy (ERP) Vehicle route problem(VRP), pre-purchase (not now) multiple loans, system leakage, in addition to its mobile services, Pakistan International Airlines (PIA) has also invested in hotels, businesses lenders, and Cargo (lift cargo) but have now scrapped all these aircraft recovery plans they should. According to the department, the Airlines is given a loan guarantee by the current government. This guarantee is a form of financial guarantee of the Bank's ability to perform its day-to-day operations and to increase the required number of flights under the latest business process. The main reason for the unpublished financial statements and audits is the Replacement of Pakistan International Airlines (PIA). VRP system with new ERP system that has created audit inconsistencies and auditors' views and consolidation As the statements show a steady decline, no other means of buying the aircraft are required than rental but pre-purchase may be the only alternative when the situation is stable Pakistan International Airlines (PIA) being a sick company now has no other way to take out more loans to cover its current debts as there are no resources available, no operating profit and no strategies to reverse the current downturn solution currently taking more loans to cover the past Open weather policy and System Leakage are two main obstacles Pakistan PIA) in achieving income and expenditure targets. Strengthening the finance team by hiring more professional accountants. According to Sheikh (2020) Pakistan International Airlines (PIA) finance team went from having several professional accountants in key reporting and controller roles in 2011 to very few in 2019. Hiring more professional accountants helped address

compliance issues, as well as improve the internal control environment and help increase the function's business partner role.

Chapter 4

DATA AND METHODOLOGY

4.1 Introduction

This chapter discusses the data and methodology that will help to attain the objectives of the study. This chapter is divided into three subsections. Section 4.2 presents the conceptual framework of operating revenue and expenses and explains the factors behind the operating expense and operating revenue. Section 4.3 defines the econometric model of operating revenue and expenses. The econometric methodology for the estimation of econometric models is provided in Section 4.4. To decide whether Pakistan international Airlines (PIA) should retain the status of a state-owned enterprise (SOE) or not is determined based on analysis. The last section of this chapter deals to define the data and construction of variables.

4.2 Conceptual Frame Work of Operating Revenue and Expense

The conceptual framework defines how different factors contribute to operating revenue and expenses. It is evident from the literature that revenue passenger, revenue passenger carried, revenue load factor Kilometer, revenue hour flown, revenue ton kilometer. these factors are independent variables, and if we sum then we get the dependent variable. In regression analysis, it will always turn out to be significant. Therefore, you have to take these variables as a proportion of operating revenue. And also these variables are considered potential determinants of operating revenues and all these contribute to operating expenses and also contribute

proportionally to operating expenses. Muthusamy and Kalpana (2018) study operational and productivity analysis of international Airlines in India and they conclude that revenue passenger and load factors have a positive impact on the operating revenue and higher revenue passenger and load factors also lead to the growth of the economy. According to (Wright, 1973) the wage rate of the pilot and associations of person(AOP) have not significantly result on load factor of the Pakistan International Airlines(PIA). Cabral (1973) analyzed the productivity of Indian Airlines in which he concludes that revenue hour and available tone have a significant impact on revenue. These factors influence the revenue positively.

Likewise, from the literature, we come to know that number of the plane, available seats, route kilometers, and available ton kilometers affect operating expenses, These factors are the potential cause of the revenue loss and among these which are significant will be determined.

After the estimation of operating revenue and expense function. Zhu (2011) analyzed the fleet standard of US Airlines performance and the results show that fleet standardization leads to low unit cost and to reducing cost is negatively associated with profit margin. And they find that Airlines can get benefit from saving in-flight operation, can maintain a high standard fleet. (Fu, Oum, & Zhang, 2010) investigate Airlines liberalizations and their impact on Airlines competition and passenger in which they find that liberalization provides opportunities to expand the market for Airlines and air passenger grow and which lead to increase revenue passenger. This will also guide the government to tackle the issue of loss of Pakistan international Airlines and will help to promote those factors that would be the significant contributor of revenue and reduce the deficit.

4.2.1 Econometric Model of Operating Revenue and Expense

The econometric model based on the conceptual framework of operating revenue is presented in equation (4.1).

$$OR_t = a_0 + a_1 RP_t + a_2 RPC_t + a_3 RLFKm_t RLF + a_4 RHF_t + a_5 RTKm_t + \varepsilon_t \dots \dots \dots \dots 4.1$$

Where operating revenue (OR) is the dependent variable and revenue passenger (RP), revenue passenger carried (RPC), revenue load factor KM (RLFKm), and revenue hour flown (RHF) Revenue ton KM (RTKm) are set of the regressor. ε_t is normally distributed error terms that capture the effect of the rest of the variables (other than independent variables of regression model) on the operating revenue. α_i (i= 1,2, …,5) are the slope coefficients and are expected to have positive significance.

The econometric model for operating expense is presented in equation (4.2)

$$OE_t = \beta_0 + \beta_1 NOP_t + \beta_2 AS_t + \beta_3 RKm_t + \beta_4 PLF_t + \beta_5 ATKm_t + \varepsilon_t \dots \dots \dots \dots (4.2)$$

where the dependent variable is operating expenses (OE), a number of planes (NOP), available seats (AS), routs Km (RKm), passenger load factor (PLF), and available ton Km (ATKm) are the potential determinants of the operating expenses. ε_t is the normally distributed error term. β_i (1= 1, 2… 5) is the slope coefficients that are expected to have a positive sign.

4.3 Econometric Methodology

As we are interested the estimating the operating revenue and expense model over some time. The time series analysis of the econometric model (4.1) and (4.2) consists of three steps. These are the unit root analysis, co-integration analysis, and the error correction model in the presence of non-stationary data.

4.3.1 Unit root test

The time-series data and the properties of data are suspect able and need more analysis. Generally, time-series data suffer from the problem of unit root and tend to be non-stationary. In case there are nonstationary variables, there might be what Granger and Newbold (1974) called spurious results. A spurious have a high R^2 and t statistic value which can be significant but the result will be without Economic meaning. So It is necessary to test the existence of unit root in each series and identify the order of integration. Ignoring the issue of unit root can lead to misleading regression and results. Augmented Dickey and Fuller test is commonly used for testing the null hypothesis that the series is non-stationary at the level of series. Ducky and Fuller provide the following three forms of unit root tests.

$$\Delta y_t \ = \ y_{t-1} \ + \ \sum \beta i_{yt-1} \ \varepsilon_t + \ \ldots \ldots \ldots \ldots \ldots \ldots \ldots (a)$$

$$\Delta_{yt} \ = \ ty_{-1} \ + \ \sum \beta i + \varepsilon_t \ \ldots \ldots \ldots \ldots \ldots \ldots \ldots (b)$$

$$\Delta y_t = \alpha_0 + y_{t-1} + \alpha_2 + \sum \beta i_{yt-1} + \varepsilon_t \ldots \ldots (c)$$

We use a general specific approach to test the null hypothesis (H1) that there is no unit root test against the alternative hypothesis (H2) that series is stationary.

4.4 Auto-Regressive Distributed Lag (ARDL) Bound test of co-Integration

To examine the existence of a long-run relationship among the variables of operating revenue and expense, ARDL bound test by Pearson et al. (2001) is highly recommendable. First, this approach covers both short-run and long-run dynamics when we test co-integration. Second, it also allows for the estimation of co-integration when some variables are I (1) and I(0) or a mixture of both. However, the pre-requisite of the model is to check the order of integration because ARDL bound testing procedure is not applicable in the presence of the I (2) series. To check the long relationship among the variables by conducting F-test for joint significance of the lagged level of variables i.e. for 1st model $\alpha_1=\alpha_2= \alpha_2= \alpha_3= \alpha_4= \alpha_5 =0$, which is null hypothesis mean that there is no long-run relationship among the variables and $\alpha_1\neq\alpha_2\neq \alpha_2\neq\alpha_3\neq \alpha_4\neq \alpha_5 =0\neq$ alternative hypothesis which state that there is a long-run relationship among the variables. And for the 2nd model null hypothesis is $\beta_1= \beta_2= \beta_3= \beta_4= \beta_5= \beta_6= 0$ and alternative hypothesis is $\beta_1\neq \beta_2\neq \beta_3\neq\beta_4\neq \beta_5\neq \beta_6\neq 0$. By null hypothesis for 2nd model mean that there is no long-run relationship among the variables and the alternative hypothesis means there is a long-run relationship among the variables. The F computed value compared with the critical value suggested by (Pearson et al., 2001). In case if F value is greater than the upper bound of the critical value then the null hypothesis is rejected and vice versa. For the null hypothesis, F statistics will be used. the 47 where all variables are I(0) and the upper bound corresponding to the case where all variables are I(1). These provide critical value bounds for all possible

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classifications of into I(0); I(1) and mutually cointegrated processes. If the F-statistic if below the lower bound one concludes that there is no integration and if the F-statistic is above the upper bound, one concludes that there is integration.

The ARDL Specification in form of an equation is, as follows. For the 1st model and 2nd model

$$OE_t = \beta_1 NOP_{t-1} + \beta_2 AS_{t-1} + \beta_3 RKm_{t-1} + \beta_4 PLF_{t-1} + \beta_5 ATKm_{t-1} + \varepsilon t$$

$$\Delta OR = \sum_{i=0}^{n} \gamma \, \Delta RP_{t-1} + \sum_{i=0}^{n} \gamma RPC_{t-1} + \sum_{i=0}^{n} \gamma \, RLFKm_{t-1} + \sum_{i=0}^{n} \gamma \, RHF_{t-1} + \sum_{i=0}^{n} \gamma RTKm_{t-1}$$

$$+ \, \varepsilon_t \, \text{...} \, \text{...} \, \text{...} \, \text{...} \, \text{...} \, .4.3$$

For the 2nd model ARDL Specification

$$\Delta OE = \sum_{i=0}^{n} \gamma \, \Delta NOP_{t-1} + \sum_{i=0}^{n} \gamma \beta 2 AS_{t-1} + \sum_{i=0}^{n} \beta \beta 3 RKm_{t-1} + \sum_{i=0}^{n} \beta 4 \, PLF_{t-1}$$

$$+ \sum_{i=0}^{n} \beta 5 ATKm_{t-1} + \varepsilon t \, \text{...} \, \text{...} \, \text{...} \, \text{...} .4.4$$

The 1st step for the ARDL Estimation technique is to comprise a bound test.

Step 1: the equation is estimated by the Error correction model. The misspecification's of the variables were checked through a diagnostic test.

Step 2: To check the long-run relationship among chosen variables, we will use the bound test.

Step 3: the critical value compared with critical values of co-integration. The lower critical value of the bound test indicates that there is no co-integration among the selected variables because it assumed that all the variables are I(0) and the upper value of the bound test show that co-integration means that all variables are I(1). The null hypothesis (H0). If the computed value of F-Static is greater than the upper bound which shows that all variables are co-integration. On the other side, the null hypothesis (H0) cannot be rejected if the F static is below the lower bound which indicates that there is no co-integration among the selected variables. And point to be noted that finding will be inconclusive if the value of F static is fallen between lower and upper bound.

The lag selection is one of the critical determinates of the relationship among the variables so therefore lag needs caution. For the lag selection, there are different criteria are used the most important and famous are Schwartz Bayesian criteria (SBC) and Akaike information criteria (AIC). Schwartz Bayesian criteria (SBC) select maximum lag while Akaike information criteria (AIC) select the smallest lag due to model selection.

Step 4: After Checking the long-run relationship the next step is to check the short-run coefficient. For this purpose, we will use Error Correction Model (ECM). Error Correction Model (ECM) Also allows testing the speed of adjustment which is a pre-requirement to long-run values when aftershocks occur in variables in the short run. To establish the long-run relationship between variables Error Correction Model (ECM) becomes.

4.4.1 ECM for Model 1 For Operating Revenue (OR)

$$\Delta OR = \sum_{i=0}^{n} \gamma\,\Delta RP_{t-1} + \sum_{i=0}^{n} \Upsilon RPC_{t-1} + \sum_{i=0}^{n} \gamma\Delta\,RLFKm_{t-1} + \sum_{i=0}^{n} \gamma\Delta\,RHF_{t-1} + \sum_{i=0}^{n} \gamma\Delta\,RTKm_{t-1}$$

$$+ \beta_1 RP_{t-1} + \beta_2 RPC_{t-1} + \beta_3 RLFKm_{t-1} + \beta_4\,RHF_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots 4.5$$

4.4.2 ECM for Model 2 Operating Expenses (OE)

$$\Delta OE = \sum_{i=0}^{n} \gamma\,\Delta NOP_{t-1} + \sum_{i=0}^{n} \Upsilon AS_{t-1} + \sum_{i=0}^{n} \gamma\Delta\,RKm_{t-1} + \sum_{i=0}^{n} \gamma\Delta\,PLF_{t-1} + \sum_{i=0}^{n} \gamma\Delta\,ATKm_{t-1}$$

$$+ \beta_1 NOP_{t-1} + \beta_2 AS_{t-1} + \beta_3 RKm_{t-1} + \beta_4\,ATKm_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots (4.6)$$

This step comprises estimating correct significance and sign of error correction coefficient. It is known as the convergence of equilibrium after shock disturbance of revenue and cost of the Pakistan International Airlines(PIA). The larger error correction coefficient means that faster convergence to the equilibrium.   After this estimation, the fitness of the estimated model is checked through a diagnostic test. For this purpose, several tests will be conducted for checking heteroscedasticity in the error term, normality of the variables, function form of the equation, and serial correlation.

4.4.3 Error Correction Model

Co-Integration and error correction models have strong linkages. The linkage is derived from One of the most important theorems "The Granger Representation Theorem". This theorem state that if two variables A and B are cointegrated the relationship between these two variables can be

expressed in Error Correction Model (ECM). It represents the short-run dynamic relationship among the variables.

4.4.4 Diagnostic Test

After the application of the Error Correction Model (ECM), we also apply diagnostic to check the stability of our results. The null hypothesis(H0) of the diagnostic test is the result are stable and the alternative hypothesis (H1) is that our results are not stable.

4.5 Construction and Definition of Variables

The construction of variables section is composed of the following variables.

4.6 Variables of Operating Revenue

4.6.1 Dependent variable

The dependent variable of Pakistan international Airlines is operating revenue and operating revenue which is determined by different variables.

➢ **Operating Revenue**

Operating revenue is defined as the revenue received by Pakistan international Airlines from all the operations like cargo service and also from both scheduled and non-scheduled service. The operating revenue of Pakistan international Airlines is measured in Pakistani currency. Davila and Venkatachalam (2004) concluded that in their study the factors that determined the

probability of some international Airlines that Airlines have high passenger load factor have relatively low cost.

> **Revenue Passenger**

Revenue passenger is the revenue that Airlines receives from passengers which they pay for their trip. This excludes employees of the Airlines, free tickets and passes, and underage children. Huston and Butler (1991) analyzed the factor affecting Airlines hubs in which he concludes that allowing hubs to get more passengers reduced the cost and increased revenue of passengers.

> **Revenue Passenger Carried**

It is the measure of passenger revenue from the origination point to the final destination point. It measures a mile. Rossello (2011) investigate the oscillation influence on European Airlines in which he finds that climate changes and geographic location affect the revenue of passengers carried. Revenue passenger carried is calculated as the number of passenger fare multiplying passenger fare.

> **Revenue Hour Flown**

Revenue Hour flown is the revenue received by an Airlines on an hourly basis.it is calculated per hour passenger fare minus cost. (García & Cadarso, 2017) Studied fleeting of Airlines and managing revenue and operating maintenance in which they flying hours until maintenance is

not considered to find that operations may dramatically influence aircraft airworthiness if available.

> ### Revenue Ton Kilometer

A revenue ton kilometer is revenue when a metric ton of revenue load is carried one kilometer. Such types of load include passenger load and the number of passengers converted into weight. Chow (2014) Check the impact of customer satisfaction and service quality of Chinese Airlines in which found that Airlines that have short rout have more revenue per kilometer.

4.7 Variables of Operating Expense Model

> ### Operating Expenses

Operating expenses can be defined as the cost required for running a business. Total operating expenses for a given Airlines are then obtained by summation of all aircraft an entity operates followed by summation for all entities operated by the Airlines (Harris, 2005).

4.7.1 Independent variables

> ### PIA Fleet Number of Plane

It is a group of aircraft which are currently operating under the Pakistan international Airlines.it measured in simple numbers. Currently, Pakistan international Airlines have 46 fleets.

> **Available seats**

Available seats refer to that how many seats are available for traveling of the Airlines the total number of seats offered by an Airlines for traveling. According to Williams (2020) to increase the chances of availability of seats is depending on fares. Airlines must charge low to increase output.

> **Routes Km (RKm)**

Routes km (RKm) is the distance between two points by which is covered Airlines. The distance covered by an Airlines is measured by kilometer.

> **Passenger load factor**

Passenger load factor is the measure of passenger-carrying capacity by an Airlines that how much it is used and how much output of Airlines is consumed. It is measured in percentage and high load factors means that fewer seats are empty and vice versa. Generally, it is used to observe that how efficiently the Airlines is filling seats and generating revenue. Passenger load factor is calculated by the number of passengers divided by the number of seats of flight. Wang, Zhang, and Zhang (2018) studied the determinate of passenger load factor of Chinese Airlines and conclude that passenger load factors may affect competitors, and factors associated with passenger load factors can fluctuate passenger load factors.

> **Revenue load factor KM (RLFKm)**

Revenue load factor KM (RLFKm) is the total mass of passengers, cargo, and baggage including both revenue, non-revenue load, and scheduled and non-scheduled services of the Airlines that how much revenue is received from theirs.it is calculated revenue passenger mile divided available seat mile. According to (Szabo, Mako, Tobisova, Hanak, & Pilat, 2018) Revenue load factor is defined as the percentage of seats filled by revenue passengers.

4.8 Data source

In this study, we will use time-series data in the case of Pakistan International Airlines from the period of 2000-2018 and the data source is the Economic Survey of Pakistan (various Issues).

4.9 Variable Description

Table 4.1 Operating Revenue Model 1 variables Description

Variable	Definition	Unit	Source
Operating Revenue	It is the Revenue Received by Pakistan International Airlines from all the services	Pkr	Economic Survey of Pakistan
Revenue Passenger	the revenue which Airlines receive from passengers which they pay for their trip	Pkr	Economic Survey of Pakistan
Revenue Passenger	It is the measure of point from the origination point to the final destination	Miles	Economic Survey of Pakistan

Carried	point.		
Revenue Hour Flown	It is the revenue received by an Airlines on an hourly basis	Pkr	Economic Survey of Pakistan
Revenue Ton Kilometer	It is the revenue when a metric ton of revenue load is carried one kilometer	Tone	Economic Survey of Pakistan
Revenue Load Factor	It is the percentage of seats filled by revenue passengers.	Percentage	Economic Survey of Pakistan

Table 4.2 Operating expenses Model 2 variable description

Operating Expenses	Operating expenses can be defined as the cost required for running a business.	Pkr	Pakistan Economic Survey
PIA fleet number of plane	It is a group of aircraft which are currently operating under the Pakistan international Airlines.	Numbers	Pakistan Economic Survey
Available seats (AS)	Available seats (AS) refer to that how many seats are available for traveling of the Airlines the total number of seats offered by an Airlines for traveling.	Number	Economic Survey of Pakistan
Routs Km (RKm)	Routs km (RKm) is the distance between two points which is covered by the Airlines.	Kilometer	Economic Survey of Pakistan
Passenger Load	Passenger load factor is the measure	Percentage	Economic Survey of

Factor	of passenger-carrying capacity by an Airlines that how much it is used and how much output of Airlines is consumed.		Pakistan
Revenue load factor KM (RLFKm)	Revenue load factor KM (RLFKm) is the total mass of passenger, cargo and baggage services of the Airlines that how much revenue is received.	Kilometer	Economic Survey of Pakistan

Chapter 5

Results and Discussion

5.1 Introduction

The study aims to check the factors affecting the business of Pakistan International Airlines(PIA). In this respect, it uses time-series data from the period 2000-18 and it is disaggregated into operating revenue and operating expenditure. Particularly this study use ARDL Estimators for testing the long-run relationship between variables. A specific and general way to work in this technique has been adopted by the researcher in the field of economics and applied econometrics. Therefore, it follows the standard path. The essential steps include, firstly, unit root test to check time series data, secondly, ARDL estimators are used to check long-run relationships among the variables. Thirdly, using statistical testing to find long term and short term coefficients. Finally, we check stability through CUSUM and CUSUMSQ.

5.2 Unit root test

Time series data need to check the stationarity of the data by using unit root test and following Augmented dicky fuller (ADF) test due to the assumption of bound test that variables must be I (0) or I (1) But not I (2), so for ensuring I(0) or I(1) we will check stationarity and for ARDL we need to Pre-test that all the variables must be of order I(0) or I(1), not I(2). The ADF results of model 1 are below in a table.

5.3 Model 1 Operating Revenue

5.3.1 Descriptive statistics

Table 5.1 Descriptive statistics

	OR	RHF	RKF	RLF	RP	RPC
Mean	80153.95	125017.40	75203.42	54.49	13363.37	5137.74
Median	88998.00	130977.00	76212.00	55.00	13751.00	5297.00
Maximum	116551.00	142940.00	88302.00	59.00	15664.00	5953.00
Minimum	39228.00	101556.00	61389.00	49.00	10780.00	4166.00
Std. Dev.	24745.21	13083.69	7942.96	2.96	1416.79	539.00
Skewness	-0.34	-0.40	-0.37	-0.31	-0.08	-0.57
Kurtosis	1.81	1.88	2.07	2.42	2.05	2.10
Observations	19.00	19.00	19.00	19.00	19.00	19.00

5.3.2 Unit Root Test operating Revenue Model

The Autoregressive distributed lag (ARDL) can be considered without taking into consideration if the data series is I (0) or I (1) or fractionally co-integrated. In the case of I (2), ARDL estimation becomes impractical and the assumption of the bound test remains subject to, i.e. that variable must be I (0) or I (1). Then the level of stationarity is valid for testing. We are following it and the order of co-integration is tested by the Augmented Dicky Fuller test(ADF).

Table 5.2 ADF at level

Variable	T-stat (P=value) without trend and intercept	With constant	With constant and trend	Order of integration	Method
OR	-1.21(.12)	-1.53(.49)	-2.35(.38)	I(1)	ADF
RHF	-.53(.30)	-3.04(0.003)	-3.26(.10)	I(0)	ADF
RKF	-.19(.59)	-2.99(0.0)	-3.05(.14)	I(1)	ADF
RLF	2.01(.02)	-.208(.03)	-1.97(.04)	I(0)	ADF
RP	.22(0.73)	-2.840.07)	-2.70(.24)	1(1)	ADF
RPC	-0.23(.56)	-2.94(0.06)	-2.83(.20)	1(1)	ADF
RT	-.13(.62)	-2.25(0.019)	-2.17(0.46)	I(1)	ADF

significance level at 10%

The hypothesis for the unit root test is that there is non-stationarity that is there is a unit root in the series. The test statistics indicate that all the variables are not integrated in the same order.

We can observe from the table that variables like Operating revenue(OR,) Revenue passenger (RP), revenue passenger carried(RPC) and Revenue tonne(RT) is stationary at level mean have ordered I (1) while revenue hour flown(RHF), Revenue kilometer flown(RKF), revenue load factor(RLF) are non-stationary at level i.e. have an order of I (0) at the level.

The finding also shows that there is no data series is of order I (2) which means that all the data series are of I (0) or I (1). For augmented ducky fuller (ADF) the lags number represents the maximum delay of the auto regressive term. All data series are integrated of order I (1) or I (0) and none series order o I (2). Therefore, the choice of Auto-Regressive Distributed Lag (ARDL) which is suggested by Pesaran and Shin (1995) is an appropriate and suited method for this type of variable.

5.3.3 Lag Length Criteria

The lag length criteria are checked through the Akaike information criterion (AIC) and Schwarz information criterion(SIC). The following table shows both AIC and SIC. The selected lag length is 2.

Table 5.3 Lag Length Criteria

Lag	AIC	SIC
1	86.95	87.25
2	84.31*	86.39*

*indicates shows the lag selection order criterion

 AIC: Akaike information criterion

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SIC: Schwarz information criterion(SIC)

5.3.4 Diagnostic Tests

Diagnostic tests are applied to check normality, autocorrelation and hetereoscadsicity. After the Bound test, we also apply diagnostic to check the normality, autocorrelation and hetereoscadsicity of our results. The null hypothesis(H0) of the diagnostic test is as follow.

For Autocorrelation

H1: there is no autocorrelation

H0: there is autocorrelation

For Heteroscedasticity

H1: there is no Heteroscedasticity

H0: there is Heteroscedasticity

Table 5.4 Diagnostic tests

Normality test		Autotest(BG Test)		Hetero test(BPG test)	
Jarque-Bera	2.44	F-statistic	2.52	F-Statistics	0.79
Probability	.293	Prob. F(1,6)	0.16	Prob. F(11,6)	0.64

		Prob.Chi-Square(1)	0.02	Prob. Chi-Square(1,1)	0.46

Interpretation: the autocorrelation BG test state that there will be autocorrelation if F value is greater than significance value. Here F value is 2.52 which is greater than sigficane value and we are not accepting null hypothesis.for Heteroscedasticity if the F is greater than significance value than there is Heteroscedasticity, here F value is 0.79 which is greater than signifance value and we are not accepting null hyphothesis.

5.3.5 Bound Test

Table 5.5 Bound Test result

Test Statists	Value	Significance level	I(0)	I(1)
F stats	7.63	10%	2.334	3.515
		5%	2.794	4.148
		1%	3.976	5.691

The bound test of the model conduct and the F statistic value is 7.63 which is greater than the upper and lower bound value which shows the existence of a long-run relationship.

5.4 Long run result:

Table 5.6 long run result Result

Variable	Coefficient	Std. error	t-statistic	Probability

RHF	1.37	0.40	3.39	0.01
RKF	-10.17	2.29	-4.44	0.00
RLF	-3423.94	1102.85	-3.10	0.02
RP	23.96	4.01	5.98	0.00
RPC	64.62	24.75	2.61	0.03
RT	29.88	58.06	0.51	0.62
C	167671.90	65159.74	2.57	0.04

In the model of Operating Revenue, the value of revenue hour flown(RHF) is 1.37 which is significant the one unit change in revenue hour flown(RHF) brings 1.37 in operating revenue. According to Doherty (1970) if the revenue per hour of an Airlines increasing it will increase the total revenue of the Airlines. it is due to If the hourly revenue of the Airlines is increasing it will decrease the cost and will also lead to increase operating revenue of the Airlines. Revenue kilometer flown have -10.17 which means One unit change in revenue kilometer flown will decrease -10.17 changes in operating revenue. According to (S. Ali, 1994) in the Indian Airlines, the dramatic increase in revenue occurred when the Airlines expand the route. In the case of Pakistan, international Airlines revenue kilometer flown have a negative impact on operating revenue because when PIA cover the long-distance the fare will high when the fare is high due to fixed cost the variable cost of high fare and also the majority of flights have a low number of a passenger even in some case situations it does not cover the cost of flights. Which leads to an increase in the operating cost and a decrease in operating revenue. The coefficient of revenue load factor is -3423.935 which negative but significant impact on operating revenue.1-unit

decrease in revenue load factor will cause -3423.935 change in operating revenue. According to (Szabo et al., 2018) high load factor is considered important profitability of the Airlines, but the result shows a negative relationship. The main reason is the mass of the passenger which is very low in PIA and the low mass of the passenger leads to low revenue even in some situations negative revenue. The coefficient of Revenue for the passenger is 23.97 which shows a positive and significant impact on operating revenue. One unit change in revenue passenger brings 23.97 changes in operating revenue. According to (Fu et al., 2010) the main hubs help to get more passengers and from the main hubs of PIA the number of passengers is larger, and when there is a large number of a passenger the revenue of passengers will also increase. The revenue passenger carried also shows the positive and significant result which value of the coefficient is 62.64 which means that one unit change in revenue carried bring 62.64 changes in operating revenue. (Rossello, 2011) investigate the oscillation influence on European Airlines in which he finds that climate changes and geographic location effect the revenue of passenger carried. From The geographic location of Pakistan where majority of market shares are owned by PIA can't be denied. The result of revenue ton is in significant.

5.4.1 CUSUM:

The stability of the parameter of the model of the cumulative sum of recursive residuals (CUSUM) and CUSUM square (CUSUMSQ) is presented by Peseran(1997).
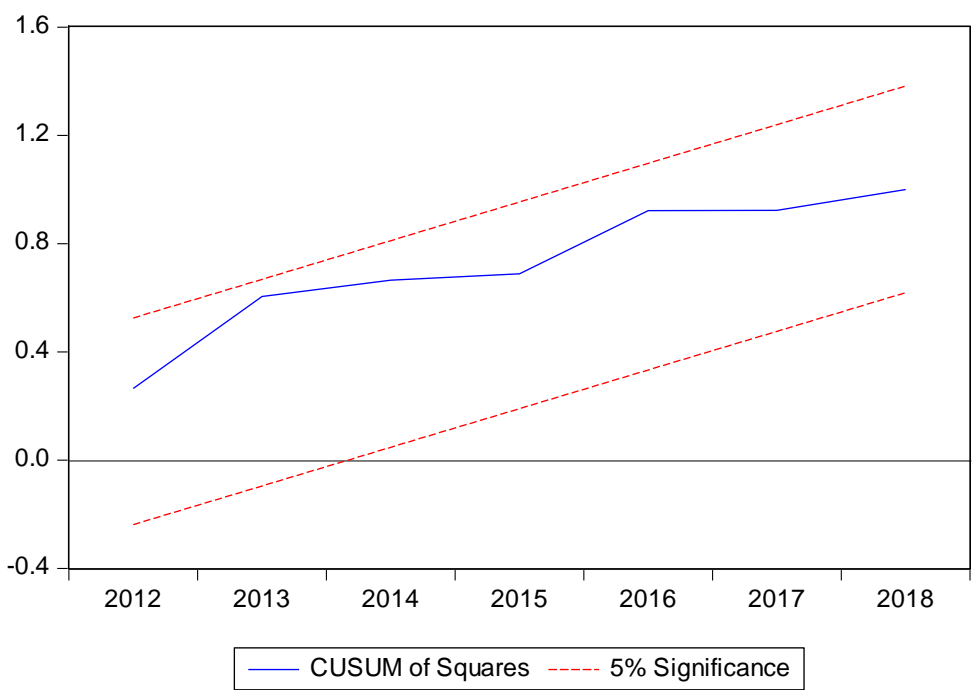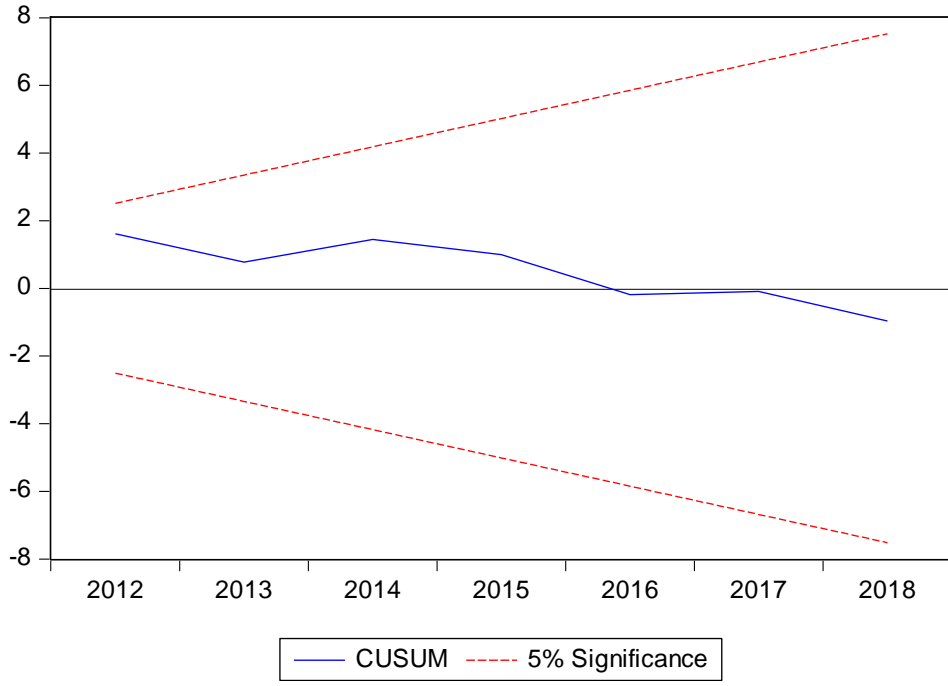
From the graphs, we can observe that the plot of CUSUM falls inside the Critical band and CUSUM statistics fall under the band of 5% critical interval. so we can conclude that the model has stable results.

5.4.2 Error Correction Model(ECM)

Table 5.7 ECM result

Variable	Coefficient	Std. Error	t-Statistic
D(RKF)	-4.96	0.45	-11.03
D(RP)	9.41	1.07	8.81
D(RPC)	32.83	4.49	7.31
CointEq(-1)*	-0.77	0.07	-11.05
R-squared	0.92	Mean dependent var	3379.06
Adjusted R-squared	0.90	S.D. dependent var	8051.21
S.E. of regression	2515.09	Akaike info criterion	18.69
Sum squared resid	88559404.00	Schwarz criterion	18.89
Log-likelihood	-164.22	Durbin-Watson stat	2.78

Table 5.7 shows the results error correction model (ECM). the value of CointEq (-1) is -.77. which means that the 77% error in the dependent variable is corrected in the signal period.

5.1 Result of Operating Expenses Model 2

5.1.1 Descriptive statistics

Table 5.8 Descriptive statistics of Operating statistics

	OE	PLANE_NO_	PLF	R_KMS	AS	AT
Mean	94572.47	39.84	69.95	366239.70	18907.47	2764.79
Median	106811.00	40.00	70.00	367251.00	19108.00	2798.00
Maximum	170447.00	45.00	74.00	460719.00	21726.00	3369.00
Minimum	38097.00	32.00	65.00	257858.00	15775.00	2242.00
Std. Dev.	39186.45	3.92	2.57	61215.35	1698.43	306.89
Skewness	-0.02	-0.46	-0.42	-0.12	-0.17	0.12
Kurtosis	1.91	2.14	2.25	2.10	2.00	2.02
Observations	19.00	19.00	19.00	19.00	19.00	19.00

5.1.2 Unit root test

The results of the unit root test indicate that all the variables are integrated of I (1) or below. None of the variables are integrated of order I (2) or above. So we will use the bound test

to observe the long-run relationship among chosen variables in the context of operating revenue. It is the best estimator when variables are I(0) and 1(1). OLS estimators are used in the case when all the variables have ordered I(0) and the vector error correction method (VECM) Johnson approach is applicable if all the variables are not stationary.in case if some variables are I(1) then OLS is not the right method because OLS requires to behave like a constant if we apply OLS in this study mistakenly it will show a high t-value the results will be spurious. Auto-Regressive Distributed Lag (ARDL) become appropriate method for this study. The finding of co-integration is shown in the table.

Table 5.9 ADF at level

Variable	No trend & cons	Constant	Constant and Trend	Order of integration	Method
OE	-.44(.88)	-.44(.88)	**-2.35(.38)**	I(1)	ADF
AS	-.22(.73)	-3.21(0.03)	**-3.12(.13)**	I(1)	ADF
AT	-.27(.57)	-2.22(.20)	**-2.27(.42)**	I(1)	ADF
Plane No.	-2.01(0.03)	-2.21(0.02)	**2.00(0.01)**	I(0)	ADF
RKM	-0.03(0.04)	-1.77	**-0.03(0.04)**	I(0)	ADF
PLF	1.24(0.03)	**-1.89(.32)**	-4.36(0.01)	I(1)	ADF

Table 5.9 show that all the variables are not integrated in the same order. We can observe from the table that variables like operating Expenses (OE). Revenue, available tonne(AT) and Number of (Plane No.) are stationarity at a level and all other remaining like Available seat(AS), passenger load factor (PLF) and revenue kilometer (RKm) have the same order of integration at

the level that is an order of I(O). As we can observe from the table the order of integration of all the variables are not the same and the results are mixed obtained from the unit root test which justifies using the ARDL technique to estimate the long-run and short-run relationship among the variables.

5.1.3 Lag length criteria

The lag length criteria is checked through the Akaike information criterion (AIC) and Schwarz information criterion(SIC). The following table shows both AIC and SIC. The selected lag length is 1.

Table 5.10 Lag length criteria

Lag	AIC	SIC
0	86.95	87.25
1	84.31*	86.39*

5.1.4 Bound test

Table 5.11 bound test result

Test Stats	Value	Significance level	I(0)	I(1)
F stats	9.11	10%	-1.62	-3.49

| | | 5% | -1.95 | -3.83 |
| | | 1% | -2.58 | -4.44 |

The bound test of the model conduct and the F statistic value is which is greater than the upper and lower bound value which shows the existence of the long-run relationship.

5.1.5 Long run result

Table 5.12 long run result

Variable	Coefficient	Std.error	t-statistic	Probability
AS	-6982.02	3778.71	-1.85	0.10
AT	14285.24	7787.37	1.83	0.10
PLANE_NO_	-0.43	0.38	-1.14	0.29
PLF	-5.75	59.04	-0.10	0.92
R_KMS	18.55	13.50	1.37	0.21
C	-789622.30	571866.30	-1.38	0.20

significance level at 10%

In the model of operating expenses, the value of available seats (AS) is -6982.02 which is negative but significant. The one-unit change in the available seat (AS) decrease 6982.02 unit

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changes in operating expenses. (Williams, 2020) find out that to increase the chances of availability seats is depending on fares due to available seats the operating expenses decrease because the fare of Pakistan international Airlines is low as compared to other especially Airlines hence low fare help to reduce the operating expense of Pakistan international Airlines. The coefficient of an available tonne is 14285.24 and significant which means that a one-unit change in available tonne (AT) will decrease 14285 rupees operating cost.

5.1.6 Diagnostic tests

Diagontics test are applied to check normality, autocorrelation and hetereoscadicty. After the Bound test, we also apply diagnostic to check the autocorrelation and hetereoscadicty of our results. The null hypothesis(H0) of the diagnostic test is follow.

For Autocorrelation

H1: there is no autocorrelation

H0: there is auto correlation

For Heteroscedasticity

H1: there is no Heteroscedasticity

H0: there is Heteroscedasticity

Table 5.13 diagnostic tests results

Normality test		Autotest (BG)		Hetero test (BPG test)	
Jarque-Bera	0.01	F-statistic	1.80	F-statistic	3.21
Probability	.99	Obs*R-squared	3.00	Obs*R-squared	13.33
		Prob. F(1,9)	0.21	Prob. F(8,9)	0.05
		Prob. Chi-Square(1)	0.08	Prob. Chi-Square(8)	0.10

Interpretation:

the autocorrelation BG test state that there will be autocorrelation if F value is greater than significance value. Here F value is 1.80 which is greater than sigficane value and we are not accepting null hypothesis.for Heteroscedasticity if the F is greater than significance value than there is Heteroscedasticity, here F value is 3.21 which is greater than signifance value and we are not accepting null hyphothesis.

5.1.7 CUSUM

The stability of the parameter of the model of the cumulative sum of recursive residuals (CUSUM) and CUSUM square (CUSUMSQ) (1997) is presented.
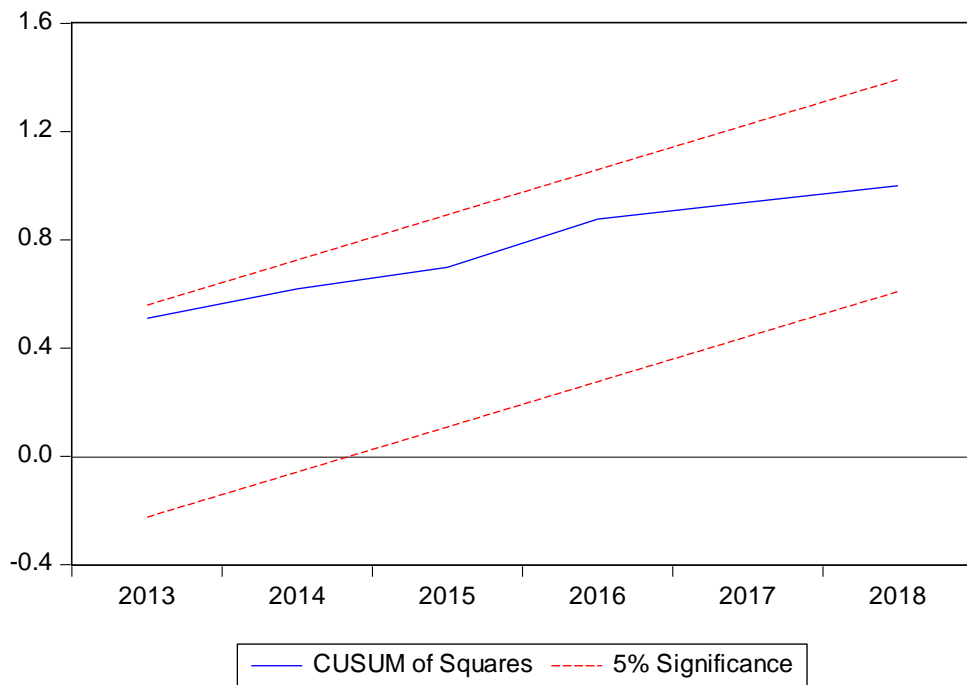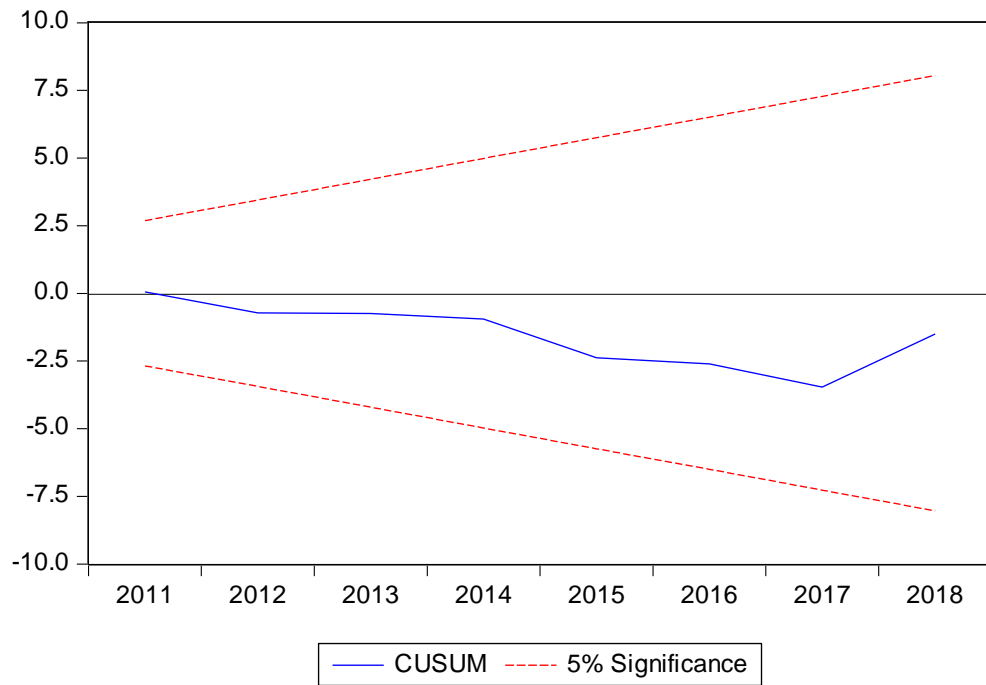
From the graph, we can observe that the plot of CUSUM falls inside the Critical band and

CUSUM statistics fall under the band of 5% critical interval. so we can conclude that the model

has stable results.

5.1.8 Error Correction Model

Table 5.14 ECM Result

Variable	Coefficient	Std.error	t-statistics
D(AS)	2.06	1.60	1.28
D(PLANE_NO_)	773.97	1086.69	0.71
D(PLF)	2478.41	1066.57	2.32
CointEq(-1)*	-0.49	0.0727	-6.74

Table 5.14 shows the results error correction model (ECM). the value of CointEq (-1) is -.49

which means that the 49% error in the dependent variable is corrected in the signal period.

Chapter 6

CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The brief that national Airlines of any country help to generate revenue and jobs creations. There was a time that Pakistan International Airlines (PIA) was considered the backbone of the economy. A large number of literature is available from different aspects of Airlines and also on Pakistan International Airlines. While different factors affecting the business of Airlines are not studied but some variables like quality of services, management training, the behaviour of the employee, available seats, fuel prices, routes, fare prices, availability of seats, passenger load factor, political instability, etc. the researchers also highlight the key issue with the performance of Airlines like corruption, bad governance, financial performance, etc.

Since the birth of PIA needed finance because it was new, and 1970s, PIA started its profit for 1st time, and it did not need government assistance.in 1990 PIA start sustaining operating losses and liquidity crises due to pilot strikes, issues of staff, vendors, and political interference in the management of PIA. In 1993 AVM Farooq Umar became managing director of PIA, and permission was granted to 12 private Airlines domestically. An open sky agreement was signed between Dubai and Karachi, due to which competition increased, and financial burden on PIA and both decisions were taken simultaneously. Now PIA dependency was on a state for financing. In 2001 Afghan war negatively affected the PIA because the Afghan air space was

closed. However, in April 2001, the new management imposed some restrictions due to which the cost per employee decreased 24% in 2002-03, which led to lower maintenance costs and increased revenue, and the Airlines became profitable again. 2010, PIA altered its livery. By 2011 the bad era of PIA started and made losses and need government subsidies. At the end of 2018, the airline was burdened with $3.3 billion in debt, up from $2.97 the year before, and thus requiring government bailouts for continued operation. In April 2019, PIA claimed that its revenues almost matched operating costs. According to the Pakistan International Airlines Corporation's first-quarter report of 2020, PIA recorded a total revenue net amount of Rs 36,442,959. Whereas the cost of service recorded total cost Rs 22,991,606 without fuel amount. For the last 2 decades, the PIA does not contribute to the economy. The objectives of the study are to identify factors that affect the business of PIA and how the burden on the state can be reduced and if we make it profitable how much deficit financing will be reduced. A composite analysis of operating revenue and operating cost by using the ARDL model. The ARDL model is tested for Pakistan International Airlines throughout 2000-19 by incorporating factors by regression.

The major points from the study are that revenue tonne has no role in operating revenue for Pakistan International Airlines under the reviewed period. From the empirical results revenue hour flown(RHF), revenue passenger (RP), and revenue passenger carried(RPC) has a positive and significant relationship with operating revenue while revenue kilometre flown (RKF) and revenue load factors (RLF) have negative but insignificant results while   Available seat(AS) have negative and available tonne have a positive and significant relationship and other variables

like the plane number, rout kilometre, passenger load factors have an insignificant relationship on operating expenses of Pakistan International Airlines.

6.2 Recommendations

Based on the results and the above discussion, it can be deduced that Pakistan International Airlines has been suffering financially and need government subsidizing for almost two decades, and it is a burden on Pakistan's economy. In this respect, the policy and recommendations on the context of results. If we look into data of operating revenue and operating expenses from 2000-18, except few years, operating expenses are more than operating revenue, and net income is negative due to which PIA is still bearing losses. Here are the recommendations by which operating revenue can be increased and operating cost can be reduced, which will lead to profit or at least reduce burden.

To Increase Operating Revenue: the revenue hour flown by Pakistan International Airlines is declining. Revenue Hours Flown data was reported at 122,081.000 Hours in 2017. This records a decrease from the previous number of 131,838.000 Hours for 2016. The Revenue Hours Flown average is 110,935.000 Hours from Dec 1966 to 2017. Pakistan International Airlines should increase revenue hours flown by reducing input like the staff of the Airlines. The operating revenue depends upon revenue kilometre flown authority needs to cut in fixed cost. In the market, there are also many other Airlines in competition. To increase the revenue load factor PIA need a mass of passenger which is very low, by providing good services and low fare compared to other Airlines. Revenue Passenger Carried data was reported at 5,342.000 Units in

2017. This records a decrease from the previous number of 5,486.000 Units for 2016. The Revenue Passenger Carried average is 4,502.500 Units from Dec 1966 to 2017, which is very low. So Pakistan international should start flights based on geographic location, which means that where flights are the need of time flights should like for tourist PIA should start for swat and Gilgit region, all these can increase the operating revenue of PIA. Note that there is a decreasing trend since the decade in all these variables.

To Reduce Operating Cost: Available Seat Kilometers data was reported at 19,201.000 km in 2016. This records an increase from the previous number of 16,666.000 km for 2015. The average 14,247.000 km from Dec 1966 to 2016, to increase the chances of availability of seats depending on fares, and the fare of PIA is almost the same to market. PIA management should focus on services on the same fare or reduce the low fare to increase seat availability, and an increase in seat availability will reduce the operating cost. Available Tonne Kilometer data was reported at 2,798.000 km in 2016. This records an increase from the previous number of 2,436.000 km for 2015. The average tonne-kilometre is 2,177.000 km from Dec 1966 to 2016 which also decreased for a decade, and it is still low due to the operating of non-profitable routes. So, PIA needs to stop operating non-profitable routes, and these routes should be operating by intra-Airlines agreement which will reduce the expenses of PIA. Note that there has been a decreasing trend since the decade in all these variables.

References:

Abbasi. (2018). Corporate Governance in Pakistan: An Exploratory Study of the Pakistan International Airlines Corporation Limited. 52(1),21-38.

Ahmad, K., & Khan, M. M. (2011). A comparative analysis of productivity of Airlines industry: Evidence from selected Asian Airlines. 2(15), 224-230.

Ahmed, M. (2017). Impact of organizational commitment on employee turnover: A case study of Pakistan International Airlines PIA.6(2),108-122.

Ali, F. (2015). An assessment of service quality and resulting customer satisfaction in Pakistan International Airlines: Findings from foreigners and overseas Pakistani customers.3(12).102-124.

Ali, S. (1994). A Comparative Study of the Financial Performance of Air India Corporation and Indian Airlines Corporation. Aligarh Muslim University. 6(2),108-122.

Atalık, Ö., Bakır, M., & Akan, Ş. (2019). The role of in-flight service quality on value for money in business class: a logit model on the Airlines industry. 9(1), 26.

Baloch, Q. B., Jamshed, J., & Zaman, G. (2014). Enhancing Service Quality & Reviving Competitiveness of Pakistan International Airlines. 7(2), 346-359.

Barbot, C., Costa, Á., & Sochirca, E. (2008). Airlines performance in the new market context: A comparative productivity and efficiency analysis. 14(5), 270-274.

Berry, S., & Jia, P. (2010). Tracing the woes: An empirical analysis of the Airlines industry. 2(3), 1-43.

Cabral, L. (1973). Productivity in Indian Airlines: A Preliminary Comparative Study.4(6). 2183-2194.

Chow, C. K. W. (2014). Customer satisfaction and service quality in the Chinese Airlines industry. 35, 102-107.

Davila, A., & Venkatachalam, M. (2004). The relevance of non-financial performance measures for CEO compensation: Evidence from the Airlines industry. 9(4), 443-464.

Doherty, R. P. (1970). The Origin and Development of Chicago-O'Hare International Airport: Ball State University. 3(2), 264-290.

Farooq, M., Muhammad, S., Raju, V., Kalimuthu, K. R., & Qadir. (2019). Measuring and comparing the desired and actual service quality of Pakistan international Airlines. 5(2), 484-490.

Farooq, M., Muhammad, S., Raju, V., Kalimuthu, K. R., & Qadir, A. (2019). Measuring and comparing the desired and actual service quality of Pakistan international Airlines. 5(2), 484-490.

Fu, X., Oum, T. H., & Zhang, A. (2010). Air transport liberalization and its impacts on Airlines competition and air passenger traffic. 2(3),24-41.

García, S., & Cadarso, L. (2017). Airlines re-fleeting managing revenues and maintenance operations. 27, 1121-1128.

Granger, C. W., & Newbold, P. (1974). Spurious regressions in econometrics. 2(2), 111-120.

Harris, F. D. (2005). An economic model of US Airlines operating expenses. 2(2), 231-350.

Huston, J. H., & Butler, R. V. (1991). The Location of Airlines Hubs. Southern Economic Journal, 57(4), 975-981. doi:10.2307/1060327

Lin, W.-C. (2012). Financial performance and customer service: An examination using activity-based costing of 38 international Airlines. 19, 13-15.

Mohamed, T. A., AbdelFattah, Y., & Gadallah, M. (2008). Improvement of Airlines industry service quality. 1(1), 61-75.

Mughni, W. A Critical Analysis on Pakistan's National Aviation Policy (2015): Flight Path, Cross Winds & Course Correction.

Muthusamy, A., & Kalpana, G. (2018). Operational and Productivity efficiency of International Airlines in India. 2(2), 111-120.

Nawaz, N., Manzoor, S. F., Jahanian, A., & Mumtaz, R. (2012). Factors underlying the failure of organizations: a focus on Pakistan International Airlines. 2(6), 1-17.

Park, J.-H., & Zhang, A. (2000). An empirical analysis of global Airlines alliances: cases in North Atlantic markets. 16(4), 367-384.

Pearson, G., Robinson, F., Beers Gibson, T., Xu, B.-e., Karandikar, M., Berman, K., & Cobb, M. H. (2001). Mitogen-activated protein (MAP) kinase pathways: regulation and physiological functions. 22(2), 153-183.

Pesaran, M. H., & Shin, Y. (1995). An autoregressive distributed lag modelling approach to cointegration analysis. 2(2), 111-120.

Rossello, J. (2011). North Atlantic Oscillation influences on European Airlines traffic. 16(2), 183-187.

Saleem, M. A., Zahra, S., & Yaseen, A. (2017). Impact of service quality and trust on repurchase intentions–the case of Pakistan Airlines industry. 2(2), 111-120.

Selase, A. E. (2018). Building image in the Airlines industry. Pakistan international Airlines as the point of convergence. 5(5), 3830-3834.

Shah, S. K. A., Ali, N., & Ali, Z. (2015). Declining employee performance in public sector organizations: An etiological study of public sector organizations in Pakistan. 1(05),124-139.

Szabo, S., Mako, S., Tobisova, A., Hanak, P., & Pilat, M. (2018). Effect of the load factor on the ticket price. 2(13) 144-162.

Wang, K., Zhang, A., & Zhang, Y. (2018). Key determinants of Airlines pricing and air travel demand in China and India: Policy, ownership, and LCC competition. 4(63), 80-89.

Williams, K. (2020). Dynamic Airlines pricing and seat availability. 2(2), 115-127.

Windle, R. J. (1991). The world's Airlines: a cost and productivity comparison. 3(1),31-49.

Wright, J. W. (1973). Wage differentials and structure in the international Airlines industry, 1950-70: Wayne State University. 2(2), 111-120.

Zhu, J. (2011). Airlines performance via two-stage network DEA approach. 4(2), 260-269.