THE EFFECTS OF COUNTRIES 'ECONOMIC DEVELOPMENT ON AIRLINE COMPANIES' PERFORMANCE: TURKISH AIRLINES, LUFTHANSA, ALITALIA COMPARATIVE EXAMPLE

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ABSTRACT

THE EFFECTS OF COUNTRIES 'ECONOMIC DEVELOPMENT ON AIRLINE COMPANIES' PERFORMANCE: TURKISH AIRLINES, LUFTHANSA, ALITALIA COMPARATIVE EXAMPLE

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Air transport is one of the most international sectors in the world, which has important economic, cultural and social benefits to countries and humanity. Also economic regulations and power of the countries have important effects on airline management and performance. The purpose of this study is to examine the long and short-term relationships of the effects of the countries economic development on the performance of airline companies. Therefore, Lufthansa from Germany as a developed country and Turkish Airlines of Turkey as a developing country discussed in this analysis. Using the 1997-2021 year period data for Turkish Airlines and Lufthansa and 1997-2008 year period data for Alitalia. These datas obtained from Reuters. Additionally, Italy's Alitalia was included in the analysis as a control unit. In this the microeconomic analysis, the long and short-term relationships between the variables of ROA (Return on Assets), Leverage (Total Debt/Total Capital), Current Ratio (Current Ratio) and Administrative Expenses were examined by Vector Autoreggesive (VAR) analysis for all three countries.

In this study, the macroeconomic data of Germany, Italy and Turkey between the years 2007-2020 were analyzed with the macroeconomic data of growth, population, unemployment, inflation, imports and exports from the European Statistical Office. Italy was not included in the economic evaluation between countries due to insufficient data on Alitalia.

Keywords: Aviation, Airline Companies, Economy, Microeconomy, Macroeconomy, Economic Development, Turkish Airlines, Lufthansa, Alitalia

ÖZ

ÜLKELERİN 'EKONOMİK GELİŞİMİNİN HAVAYOLU ŞİRKETLERİNİN PERFORMANSINA ETKİLERİ: TÜRK HAVA YOLLARI, LUFTHANSA, ALITALIA KARŞILAŞTIRMALI ÖRNEĞİ

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Hava taşımacılığı, ülkelere ve insanlığa önemli ekonomik, kültürel ve sosyal faydalar sağlayan, dünyanın uluslararası sektörlerinden biridir. Ayrıca ülkelerin ekonomik düzenlemeleri ve güçleri havayolu yönetimi ve performansı üzerinde önemli etkilere sahiptir. Bu nedenle, gelişmiş bir ülke olarak Almanya'dan Lufthansa ve gelişmekte olan bir ülke olarak Türkiye'den Türk Hava Yolları bu analizde ele alınmıştır. Türk Hava Yolları ve Lufthansa için 1997-2021 yılı, Alitalia için 1997-2008 yılı verileri kullanılmıştır. Bu veriler Reuters'ten alınmıştır. Ayrıca İtalyan Alitalia kontrol birimi olarak analize dahil edilmiştir. Bu mikroekonomik analizde, ROA (Varlık Getirisi), Kaldıraç (Toplam Borç/Toplam Sermaye), Cari Oran ve Yönetim Giderleri değişkenleri arasındaki uzun ve kısa vadeli ilişkiler üç ülke içinde Vektör Otoregresif analizi (VAR) ile incelenmiştir.

Bu çalışmada Almanya, İtalya ve Türkiye'nin 2007-2020 yılları arasındaki makroekonomik verileri ile Avrupa İstatistik Ofisi'nden alınan büyüme, nüfus, işsizlik, enflasyon, ithalat ve ihracat verileri analiz edilmiştir. İtalya, Alitalia ile ilgili yetersiz veri nedeniyle ülkeler arasındaki ekonomik değerlendirmeye dahil edilmemiştir.

Anahtar Kelimeler: Havacılık, Havayolu Şirketleri, Ekonomi, Mikroekonomi, Makroekonomi, Ekonomik Kalkınma, Türk Hava Yolları, Lufthansa, Alitalia

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I dedicate my study to my dear father Vahdettin KAHRAMAN, who encouraged me to continue and complate my doctarate.

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SYMBOL/ABBREVIATION LIST

ACI	Airports International Assembly
ADF	Augmented Dickey-Fuller Test
ADMCOSTS	Administrative Costs
AZ	Alitalia
BOAC	British Overseas Airways Corporation
DHMI	State Airports Authority
EASA	European Union Aviation Safety Agency
ECAC	European Civil Aviation Conference
EUROCONTROL	European Organization For The Safety Of Air Navigation
GDP	Gross Domestic Product
GNP	Generally, Gross National Product
HDI	The Human Development Index
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ITA	Italia Trasporto Aereo
JAA	Joint Aviation Authorities
LCC	Low Cost Carrier
LEVRATIO	Leverage Ratio
LH	Lufthansa
ROA	Return on Assets
TK / THY	Turkish Airlines
TOMTAŞ	Tayyare Otomobil - Motor Türk Anonim Şirketi
TÖSHID	Turkish Private Sector Aviation Association
TTF	Turkish Tractor Factory
USAŞ	Aircraft Service Joint Stock Company
VAR	Vector Autoregressive Method

Chapter 1

Introduction and Aim

1.1.Background of the Study

The aviation sector is an important transportation system in international trade, which has gained momentum as a result of globalization and developments in information and communication technologies (Panitz and Glueckler, 2017). Investments and growth in the aviation sector can make a country a center in freight and passenger traffic and positively affect economic development and growth (Viswanadham and Gaonkar, 2003). Innovative technologies used in the sector and international quality standards ensure high efficiency and adaptation to new working models according to changing conditions (Saucedo-Martínez et al., 2017). Considering all these factors, it is seen that the aviation industry can quickly adapt to the changing economic structure and market conditions and can guide customer behaviors in both freight and passenger transportation.

Operations carried out by aviation sector support the planning, execution and control of the flow of goods, people and information in supply chain and logistics processes (Neubert et al., 2018). In an intensely competitive environment, it is a strategic element for manufacturers to reach their customers on time and increase their growth and profitability (Sternad et al., 2018). For this reason, aviation activities carried out by service providers constitute an important part of the logistics industry (Lai, 2004). Customer needs are met with the planning, transportation, storage, distribution, handling, insurance, customs and integrated logistics services offered (Chatterjee and Tsai, 2002; Kherbash and Mocan, 2015; Lieb and Miller, 2002; Saksoft, 2018). In general, aviation service providers (LSP) range from first-party logistics services (1PL) to fourth-party logistics (4PL) services to be involved in every phase of the activities. In the aviation sector, LSPs provide 7PL services as a combination of 3PL and 4PL, and they also carry out activities for process planning and design as well as the organization of logistics processes (Sinkovics and Roath, 2004).

Transport and logistics contribute to economies of scale and growth in a country (Tipping and Kauschke, 2016). The global aviation industry is worth approximately US$4 trillion and accounts for 8% to 20% of a country's Gross Domestic Product (GDP). Developments in the aviation sector provide convenience in international trade in terms of transportation and distribution flexibility, border crossings, speed and costs (Kalra et al., 2016). The increase in international trade volume also increases the volumes of companies operating in the aviation sector. For this reason, the aviation sector is an important component of trade as it plays an active role in the economic growth and development of a country (World Bank, 2013). In this context, steps to be taken to reduce transportation tariffs will contribute to the reduction of supply chain costs (Doherty et al., 2013).

It can be defined as the displacement of cargo, people and mail with an aircraft to provide space and time benefit. In other words, displacement of people or cargo with the help of an aircraft is possible with the air transportation service. This definition includes not only for-profit flights, but also personal flights. Regardless of the purpose, airline transportation is mentioned in case the person, cargo or mail changes by means of an aircraft (Gerede, 2011).

It is aimed to reach the point desired to be reached with the aviation sector in a safer and faster way. The most basic duties of the civil aviation authorities in the world and in our country are to make the necessary arrangements and to monitor compliance with the regulations to ensure safe and effective access to the desired destination by air transport.

Some factors have played an important role in the development of air transport. In recent years, with the development of technologies used in the world, the development of the aircraft industry, the making of international agreements accepted and obliged by all countries in the world, and the development of airport construction techniques using new technologies have played an important role in the development of air transport. The fact that the planes, which are the main actors of airline transportation, move from one place to another in a short time, that is, from a climate to another climate, reveals a close relationship between atmospheric conditions and aviation. Some meteorological conditions must be provided in areas where planes can take off or land. On the runway, where the planes will land; no side winds, low visibility, no constantly changing elevations, solid ground, etc. Attention should be paid to such situations. In case of not paying attention to these situations, flight life and property safety will be compromised (Gerede, 2015).

Many factors such as the increase in the world population, developments in technology, and radical changes in consumer demands and demands have combined with the developments and changes in the cultural structures of people, making the aviation sector one of the most developing and growing sectors in recent years. Airline companies also contribute significantly to the prestige of the countries they represent with their promotion and advertising activities on the international platform. For this reason, national and private airline companies are supported and encouraged by the managers and civil aviation authorities of the countries to which they are affiliated. Airline companies are experiencing a rapid development and modernization process with the help of the supports provided to them. The commercial and economic benefits of modernization and rapid development have paved the way for airline transportation to obtain such supports more easily (Çetin, 2002; Batur, 2008).

Airline transportation was used in wars in its early years and war has become an important tool for countries to defend themselves by making planes. With the developments, it was started to be used outside the military fields and commercial relations were ensured between the countries. In the past to date, there were some situations such as different difficulties during transportation and long transportation times and insufficient security. With the development and widespread of the airline sector, transportation was provided in a shorter period of time and a more secure transportation opportunity emerged from one place to another. This situation has encouraged the use of airline transportation both in passenger and goods transportation, in the country and abroad (Korkmaz, 2017).

With the increase in the demand for the airline, aircraft companies had to increase their flights, thereby the need to increase the number of aircraft. In order to meet this need, those producing the aircraft and its companions quickly worked to meet this need through their research and development activities. However, huge investments are required to meet this need. The underdeveloped countries could not contribute to the production of aircraft since they could not make these investments. Developed countries mostly contributed to the development and diversification of aircraft by making these investments (Yıldız, 2011).

With the development and diversification of airline vehicles, competition has emerged between the airlines companies, and they have also started to train their crews working in aircraft to gain superiority and respect for each other in passenger and cargo transportation. As a result, the quality of the aviation industry in the country has increased. While the investments made in the aviation field were made mostly by the state, with the liberalization movements, they made investments in the private sector in this field and enabled the sector to become more important in terms of economy. As in all other modes of transportation, air transportation also has various advantages and disadvantages. The biggest advantage of airline transportation is the short flight time. In other words, the most important feature in choosing the airline is time saving. Another important advantage of airline transportation is comfort. Although the airline seats of some enterprises are not wide enough, there is no fatigue in the passengers as they travel less for buses or trains (Eröz, 2017).

Effective diplomacy is also very important in the change of the sector. After the gradual lottery of the Gulf countries between 1961-1971the political countries of the region have created city-state models as indicators of full sovereignty (Ex: Bahrain and Qatar) or went to a merger like Dubai and Abu Dhabi (Ex: UAE). In both cases, de facto political and geographical city states were established with rich underground resources and large investments were initiated. Air transport is one of the most remarkable investments. The region, which has become a center of attraction for tourism and business world with the investments made by the Al-Maktum family in Dubai, has also made great strides in airway transportation (Goetz and Budd 2014, p. 118-119). Keeping the airspace completely open with the investments, Dubai acted aggressively in initiating mutual flights with each country and played its cards open.

Making big investments in airline transportation can be read as an effort to create the image of global cities all over the world as well as economic returns and justifications (Ljungkvist, 2016, p.66). It is possible to see examples of this in Hong Kong and Singapore. The motto of Cathay Pacific, the flag carrier airline of Hong Kong, was the World City of Asia. Similarly, the expression New Silk Road was used for the Gulf countries.

New city states, which are encountered as soft power elements, become more known by enriching their flight networks. Gulf airlines, which carry out advertising and sponsorship activities in international arenas, also indirectly contribute to the country's diplomacy.

Qatar has become a country that stands out with pro-active diplomacy in the region and prefers to be a soft power in many respects. Establishing relations with many countries and groups, including the Turkish Republic of Northern Cyprus and Israel, with intensive diplomacy, Qatar can use its rich underground resources as a soft power factor. While trying to turn the region into an intelligence center, it is also possible to monitor this through the Al-Jazeera channel. The aviational infrastructure of the region has been expanded with a new airport designed and operated specifically for cargo flights in Dubai. In this context, increasing airline investments is critical in terms of becoming known all over the world.

Turkey's flag carrier Turkish Airlines protection for the most points airlines flying to the distinction of being the world also has created a vision to establish diplomatic relations with all the world's next economic success. When we examine the new points that THY started with scheduled flights after 2000, we can see that Africa has taken the lead but still started scheduled flights in many parts of the world, including the Far East and South America.

Factors affecting airline demand can be grouped as follows: (Doganis, 2002, p. 196):

- Demographic factors
- Geographical factors
- Economic factors
- Socio - cultural factors
- Features of airline product components
- Characteristics of the airline product compared to replacement products (compared to other transport options)

1.2. Aim of the Study

In the literature, there are various studies on the economic effects of air transport. Figure 1 shows a framework created by Tam and Hansman (2002), Britton et al. (2005), ATAG (2008), and Laird and Mackie (2018) describing the channels of interaction between air transport and the economy in the literature. Items (1)–(3) characterize the dynamics within the aviation system. Items (4)–(6) represent the links between the aviation system and the economy as a whole.

According to the Figure, it is seen that airports and airlines make decisions about network capacity, fees and tariffs based on profitability. All of these decisions govern the supply of air transport, which affects travel costs and demand. It is seen that the changes in demand affect the profitability of the aviation industry. Employment and expenditures in the aviation industry have direct, indirect and induced effects on the economy. Direct impacts arise from activities directly related to the air transport business. Indirect effects arise from businesses that supply goods and services to the upstream supply chain, such as fuel suppliers, aircraft subcomponent suppliers, plant-construction companies. Source effects include subsequent rounds of expenditure from households directly or indirectly employed by the aviation industry itself. Direct, indirect and induced effects are all often referred to as "supply chain effects".

Air transport increases productivity, facilitates world trade, promotes tourism, increases the efficiency of supply chains, and provides investment and labor supply to both countries and regions. Thus, air transport supply facilitates the growth of other industries. In air transport in the short run, passenger travel and air freight demand are partly dependent on the level of simultaneous economic activity in a region. In the long run, economic growth in a region brings with it investments that will enable the development of all sectors, including air transport. Therefore, the interaction between air transport and the economy includes a series of “feedback effects” (ATAG, 2005, 2008; Buttonand Yuan, 2013).

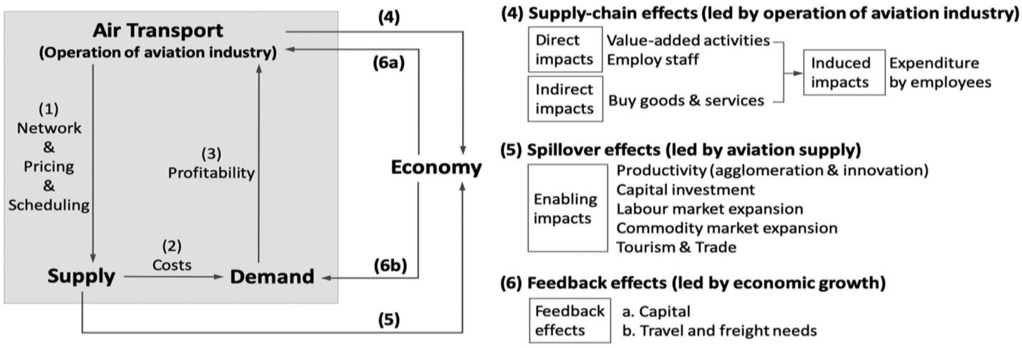


Figure 1. Major Channels That Air Transport and Economy Interact

In this study it is aimed to investigate the effect of economic development levels of the countries on the performance of airline companies. For this purpose the performance Turkish Airlines, Lufthansa and Alitalia airline companies will be compared. In this context the relationship between the economic development levels of Turkey, Germany and Italia between 2010 and 2019 and the related companies will searched.

Chapter 2

Theoretical Framework

2.1. Importance of Aviation

Aviation means the design or maintenance of the machinery necessary to fly or fly human-made aircraft. In a more general sense, the term aviation encompasses all activities, industries, institutions related to aircraft. Aviation is flying with human-made aircraft and producing or maintaining these vehicles. It is the area that covers all operations, development, industry, institutions and organizations related to aircraft such as business flights, private aviation, flight training, balloon flights, parachute jumps, sail wing flights, glider flights, aerial photography, motor sail wing flights, air ambulance flights, agricultural spraying flights, traffic inspection flights, charter flights, police patrol flights and forest fire flights. Aviation is also a supporter of economic sectors other than itself, which contribute to technological, economic and social developments. It is also an important sector that creates new job and employment opportunities.

The aviation sector, where the developments in technology are primarily applied, is developing at a dizzying pace, leading to in-country and inter-country, even intercontinental integration. Despite the recessions experienced from time to time due to reasons such as economic crises in the world, ongoing wars in various geographies and terrorist incidents, the growth in the world trade volume and especially in the tourism sector, the transportation demand brought by globalization, and also people prefer faster and more comfortable travel in long and intercontinental distances. The reasons such as the fact that they are in the air enable the rapid development of air transportation all over the world compared to other transportation alternatives. This rapid development in the civil aviation sector has increased the need for national and international regulations since the first development periods of the industry and made it indispensable for countries to play an active role in these regulations. Airline transport is generally the replacement of people and goods to be transported by an aircraft (Gerede, 2015).

When air transport is examined as a sector, it is seen that it is a sector with intense competition conditions, tightly bound to technology, very important economically and globally, with a correct relationship between the growth rates of countries and the growth of the sector, and its activities directly affect the whole world. As a result of globalization and the disappearance of the distances between countries and being seen as a single country, economic developments took place rapidly and the number of companies operating increased as a result of these developments. In addition to a factor such as the increase in the number of companies, situations such as the number of customers and flights, fuel cost, and perception differences caused intense competition among airline companies. In this context, an important point to be considered is that just as the developments in the world improve the airline sector, the development of the airline industry accelerates the developments and globalization in the world. At this point, companies aim to gain competitive advantage by making a difference in the eyes of customers (Busbin et al., 2008; Mühim, 2012).

2.2. Airline Transportation and Features of Airline Transportation Service

Air transport can be defined as a set of services that enable the displacement of persons and goods by means of an aircraft in order to benefit from certain needs. In addition to commercial flights, flights for personal purposes are also included in this definition. Regardless of its purpose, air transport is the transportation of people, cargo or mail from one point to another by an aircraft (SHGM, 2016).

Regulations for air transport are determined and implemented within the framework of the sovereign rights of countries. However, the said regulations cover all national or international civil aviation activities that take place in the airspace of the country in their jurisdiction. For example, foreign airline companies that want to use Turkish airspace are also subject to the national regulations determined by Turkey. Similarly, the foreign airline company that wants to organize scheduled or charter flights to any point in Turkey is obliged to meet the requirements of the regulations determined by Turkey.

The output of the airline transport system is a service that consists of extremely complex processes and its features are similar to other services. The features of the air transport service can be listed as follows (Doganis, 2002, pp. 4-26; Wensveen, 2007, p. 261-262):

- It cannot be stored for later presentation against fluctuations in demand.
- The service is personal and the service provided is perceived differently by each passenger.
- Airline transport service is a process and is produced and consumed at the same time.
- The quality of the service cannot be understood without consuming it.
- Airline transport service delivery is not always certain, and technical problems or weather conditions may cause delays or cancellations in flights.

2.3. Reasons for the Developlent of Airline Transportation

The purpose of air transport is to transport human or object elements to the desired point within or outside the country by air vehicles in the country. Airline transport was used in wars in its early years and became an important tool for countries to defend themselves with the construction of warplanes. With the developments experienced, it started to be used outside the military fields and commercial relations between countries were ensured. In the past, there have been some situations such as various problems during transportation, long transportation, and insufficient security. With the development and widespread use of the airline industry, transportation has been provided in a shorter time and the opportunity to travel from one place to another in a safer manner has emerged. This situation encouraged the use of airline transportation both in passenger transportation and in goods and objects transportation, both in the country and abroad (Korkmaz, 2017).

With the increasing demand for the airline, airline companies had to increase their flights and thus the need to increase the number of aircraft arose. In order to meet this need, those who produced aircraft and their complements worked quickly to meet this need with research and development activities. However, huge investments are required to meet this need. Underdeveloped countries have not contributed much to aircraft production since they could not make these investments. Developed countries have contributed to the development and diversification of aircraft by making more of these investments (Yıldız, 2011).

With the development and diversification of airline vehicles, competition has emerged among airline companies, and they have started to train their crews working on aircrafts in order to gain superiority and gain respect in passenger and freight transportation. As a result, the quality of the aviation industry has increased. At first, the investments made in the aviation field were mostly made by the state, but with the liberalization movements, it made investments in this field in the private sector and made the sector more economically important (Eröz, 2017).

2.4. Types of Aviation

Aviation has various nomenclatures in different fields according to regional and sectoral changes. However, between the classifications made in aviation types, the only distinction that is the same all over the world is the distinction between military and civil aviation. In other words, aviation types that form the basic building blocks in aviation science are military and civil aviation. Apart from these, all aviation types to be specified as a type will be covered by either military or civil aviation.

2.4.1. Military aviation. In its simplest definition, emerges from the use of aviation for military purposes. As mentioned in the history of aviation, the First World War, which took place shortly after the discovery of modern aircraft, led to a very rapid development of aviation science. In the military sense, it is a definition that includes all concepts related to aviation, defense and attack. Within the framework of defense and attack; There are acts such as identifying and stopping threats, providing support to land and naval forces against these threats, and showing the power you have.

2.4.2. Civil aviation. All non-military aviation actions in the aviation field fall under the scope of civil aviation. Civil Aviation has developed very rapidly after the Second World War and has become a sector that has undergone technological and structural changes in a short time. Especially, depending on the speed it provides in transportation, passenger and cargo transportation has made a significant progress (Korul and Küçükönal, 2003, p. 24).

2.5. Classification of Airline Companies

Four business models are generally defined in the industry. These are full service network carriers, low cost carriers, charter carriers, regional airlines and low cost carriers.

2.5.1. Full service network carriers. Traditional Airline passenger transport is airline transport that focuses on providing a wide range of pre-flight and post-flight service, including different service classes and connecting flights. In most European countries, the (traditional) national carrier operates. Air France/KLM, Lufthansa, British Airways, Turkish Airlines is one example of such businesses in the world and in Turkey this group. Most of the traditional carriers are either fully or largely privatized in EU countries.

Outside the EU, the number of different traditional airline passenger carriers and their respective ownership structures differ by country. The USA is the only country in which a significant proportion of the independent and fully privatized traditional airline carriers operate. In contrast, in many African and Asian countries, only one traditional state-owned airline operates. It is characterized by the number and model of aircraft in the Traditional Airline Operations fleet, the geographical structure in which it operates, the frequency of flights (number of flight frequency), pricing, and the service offered to the passenger (Reichmuth, 2008, pp. 5-7).

This group of airlines are also commonly known as hub-and-spoke airlines, as businesses in this group use the hub and spoke model. There are many reasons for airlines to use hub-and-spoke networks. As the number of markets in which it operates increases, unit costs per passenger decrease. In case of high demand, the use of larger aircraft reduces the unit cost per seat due to economies of scale. This phenomenon explains why the Boeing 747 and Airbus 380, the largest aircraft, fly between hubs and why the traffic volume is extremely high. From a marketing and strategic point of view, the gathering and reallocation of incoming and outgoing airline passengers at the central airport allows airline businesses to serve more markets with a given number of flights. In addition, hub carriers tend to gain market power over their hubs, reducing competitiveness at the respective airline center. These issues in Europe and Turkey, the central airports (hubs) to prevent the entry of new carriers of capacity constraints and slot rights are of particular importance due. The main disadvantages of the collect and distribute method are the complexity of combining flights and delays due to high capacity utilization. The most important reason for the implementation of hub-and-spoke networks in the past is the strictness of bilateral agreements (Cook and Goodwin, 2008, pp. 53-55).

2.5.2. Low cost carriers. Low cost carriers (LCC) focus on cost reduction to implement price leadership strategy in the markets where they offer products and services. Table 1 shows which strategic measures lead to reduction of unit cost categories.

Table 2. Cost Reduction Strategies (Reichmuth, 2008).

Cost Category	Fleet		Onboard Service			Flight Network		Marketing and Advertising	
Unit Cost Category (passenger cost per km)	Same Model Airplanes	Young Fleet	Dense Seat Configuration, Few	Paid Food and Beverage	No Seat Reservation	Small Airport	Connection Free Flight	Focus on Direct Flights	Aggressive Selling
Maintenance	x	x	x						
Fuel		x	x			x	x		
Staff	x	x	x			x			
Airport Costs			x		x		x		
Airport Traffic Control System Costs			x						
Onboard Service				x					
Capital and Lease	x		x		x		x		
Marketing and Sales			x					x	X
Other	x		x	x	x		x		

Accordingly, the use of the same model aircraft by airline companies is effective in reducing aircraft maintenance and personnel costs. On the other hand, the use of medium-sized aircraft (usually Boeing 737-700/800 or Airbus 319/320) and a young and homogeneous fleet reduces overhead costs such as fuel, aircraft maintenance, personnel costs and the unit costs of these categories. Using airports with less flight density also reduces flight delays. Low-cost carriers reduce unit costs by implementing high-density seating in aircraft, eliminating all kinds of free airline services such as in-flight entertainment, food and newspaper service, and selling registration service (online check-in) and baggage payments (Reichmuth, 2008, pp. 8-11). This application, which is involved not only in short distance but also in long distance flight activities, was introduced to the world by Soutwest Airline Company in the early 1970s and became a popular model in a short time. By 1992, Ryanair put this model into practice and following that Easyjet entered the sector in 1995 with the same strategy. In this context, offering food and beverage service with money, making ticket sales over the internet instead of agencies, and using one type of fleet are among the important applications of this model (Malighetti et al., 2009, pp. 195-203).

2.5.3. Charter carriers. Non-scheduled (charter) carriers are mostly tourist transport businesses. In the past, tickets that were not directly sold to passengers by airlines were included in charter packages offered only by tour operators. For this reason, the term "charter airline business" is commonly used to describe these airlines. However, flights to many resorts today are carried out as scheduled flights. As with low-cost carriers, businesses operating non-scheduled flights achieve low costs per seat/kilometer by using homogeneous fleets of medium and large aircraft with high density seats. However, unlike low-cost businesses, firms in this business model often offer in-flight services (meals, soft drinks, inflight entertainment, newspapers and magazines, toys for children). The main difference between low cost carriers and non-scheduled flights can be observed in the areas of network and efficiency management. While the revenue management of low-cost carriers follows an increasing price curve, non-scheduled carriers mostly follow the average price curve complemented by seasonal periods or discounts (Reichmuth, 2008, p. 11). Especially in summer when schools were on holiday in Turkey Eskisehir-Brussels and Germany-flight line it can be shown as examples of the non-scheduled flights operated by tour companies.

2.5.4. Regional carriers. Regional airlines limit their flight routes to a geographically narrow area, usually using small aircraft with a capacity of 20-100 people. Some regional carriers operate independently and focus on flights between smaller airports. Some also operate as distribution companies for traditional airline businesses and connect the central airport (hub) with regional airports. An example for the first group is VLM, the airline company of Belgium, serving between Germany and England with a 50-passenger plane. As an example of the second group, Eurowings company operates on behalf of Lufthansa (using its brand), which operates flights between Frankfurt and Munich. Due to the use of small aircraft, unit costs of regional airlines are much higher than traditional carriers and non-scheduled carriers (Reichmuth, 2008, p. 11).

2.6. Historical Development of Airline Passenger Transportation in the World

When the historical process of human flight trials is examined, it is seen that it started in the Middle Ages. When some of Leonardo Da Vinci's drawings are examined, it is seen that there are basic features of glider and helicopter flight. Studies on flight around the world continued until the early 1900s. Until the modern day of airline history, the Mongolflier brothers made successful flight trials with hot air balloons in Paris in the 16th century; Perhaps the most important invention until the later development of aircraft was the invention of the Zeppelin, which was developed by Graf Zeppelin, a German, towards the end of the 18th century, and whose accident probability was shown the highest throughout history. What started the airline industry in a modern sense and was an important turning point for inventions was the first aircraft production developed by two American brothers Orville and Wilbur Wright at the beginning of the 20th century. The Wright brothers measured the effect of the wind with kites based on a book they found in the library, and by connecting a motor to a kite, they provided this milestone development in air transport. This situation is considered to be the first motorized flight in history. Just 6 years after this flight, a French Bleriot made a long-range flight for the first time; it crossed the English Channel (Petrescu and Petrescu, 2012, p. 6; Arıkan, 1998).

These trials, which can be considered as primitive, left their place to the use of spy aircraft, which are more professional uses, in World War I. Due to the great advantage it provides, the investments after the war were made by focusing on aircraft construction. In today's sense, freight and passenger transportation took place in the 1930s. The reason for this is that the aircraft that were produced in the beginning could not be used for this purpose due to security concerns. With the technological developments since these years, more powerful engines, indicators and compasses have been developed. In other words, it has become safe enough to carry passengers and cargo with airplanes. II. Until the World War, developments were relatively slower than after the war. In the period until the war, only Boeing first produced the Boeing 247 model aircraft, then developed this aircraft and developed the DC-1, 2 and 3 aircraft. Boeing 247 and DC-3 aircraft are important among these models. Because one is the first passenger plane produced; DC-3, on the other hand, is an aircraft that allows more passengers to be carried and therefore performs more profitable flights.

Despite all these because of the wars in the world II. Aircraft usage was mostly military until after World War II (Tosun, 2017).

After the World War II, aircraft production and air transportation started to increase so much that it became necessary to make a sectoral regulation and control it by establishing a consortium. As a result, the International Civil Aviation Organization (ICAO) was established in 1944 by 54 countries under the leadership of America, England and Canada, with a contract called Chicago Convention in history. A pioneering development in the development of commercial aviation was realized with the production of the Boeing 707 type aircraft by the Boeing Company 10 years after the establishment of this institution. 15 years later, Boeing 747, one of the largest aircraft, which is still used today and used to move millions of passengers within a year, was developed (Belobaba et al., 2009; Topçu, 2016).

The aviation industry which started in the 1900s in a modern sense and developed even during the war periods, experienced its first crisis in 1990 with the Gulf Crisis. With this crisis, companies had to take measures to reduce costs in the face of increasing oil prices. With these measures taken, it could not be successful due to the Far East Asia Crisis in 1998 and 1999 and the sector started to decline (Topçu, 2016).

In the 2000s, it is seen that low-cost companies entered the aviation industry. These companies carried passengers at low prices by providing low cost and cheap, non-scheduled services and had a significant market share especially in Europe. This situation paved the way for the competitive environment, leading companies in the sector to not keep up and some of them went bankrupt. The sector, which continued to grow with these developments until 2009, started to regress with the developments experienced this year (especially the Mortgage crisis) and eventually a 5% decrease was experienced (Şengür, 2010).

The aviation sector is sensitive to growth forecasts, as it is a sector that accelerates commercial relations as well as passenger and freight transport and both affects and is affected by them. In summary, the recent developments in the world put the sector in a rapid growth process, which directly reflects on the increase in world trade volume and growth rates in both directions.

2.7. Historical Development of Air Transportation in Turkey and Story of Turkish Airlines

The most important factor in the development of civil aviation in the world and in Turkey is globalization. With globalization, the understanding of free foreign trade has become more adoption and increase in goods/services mobility, development of tourism, the gradual increase in capital flows and labor movements, along with cargo and passenger brought an increase in transportation, and the airline, along with other transportation alternatives, has had its share of developments. The development of the aviation industry is known to be directly related to the economy. There is a positive relationship between individuals' preference for airline transportation with their income levels. While the number of individuals with high income level who prefer air transportation in countries is high, on the other side this number is quite low for individuals living in countries with a low income (Yüksel, 2014, p. 10). Certainly, the negative impact of economic crises, wars and epidemics on the civil aviation sector is happening. While these developments are taking place in the world, the aviation sector in Turkey has grown rapidly in parallel with its demographic, technological and economic development and the country has increased its weight in the economy.

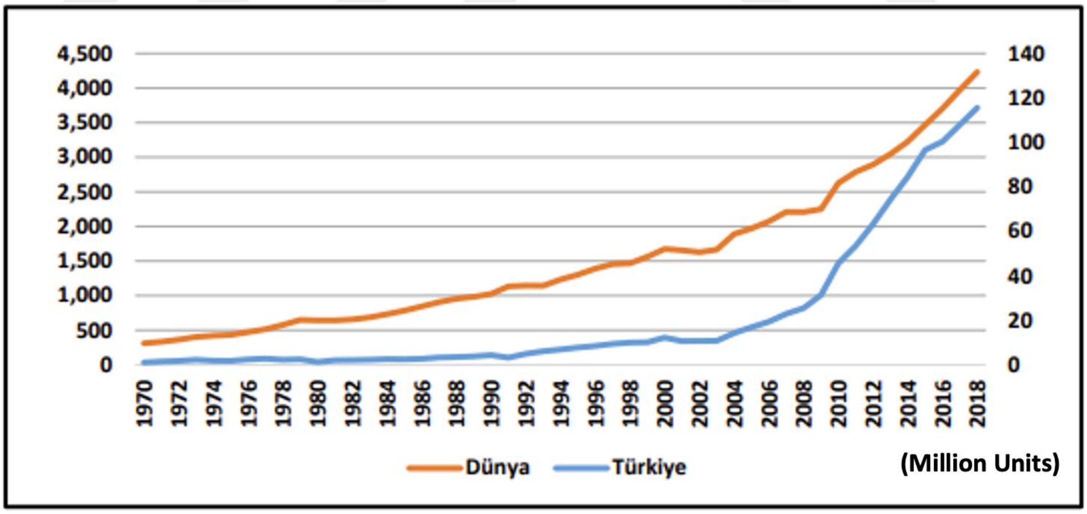


Figure 2. Number of Airline Passengers in the World and in Turkey (World Bank, 2022)

As can be seen in the graphic, there were around 300 million airline passengers in the world in 1970.Its number reached 4.3 billion in 2018 with an annual average growth rate of 5.6%.Considering that the world economic growth is 3% on average, these figures are quiteit is a good performance. Likewise, the number of passengers in

Turkey, which is 1 million, is 12% on average, increased to 115 million. The rate of increase in Turkey is twice the world average. However, due to the corona virus epidemic that started in March 2020, it increased to 50% in 2020, decreases have occurred.

Examining the aviation industry, which has had its ups and downs until today, in periods if necessary, it is possible to distinguish five periods from the Ottoman state to the present day. These periods are listing below;

- Civil Aviation in the Ottoman Period
- Civil Aviation in the Period 1923-1950
- Civil Aviation in the 1950-1980 Period
- Civil Aviation in the Period 1980-2003
- Developments After 2003

2.7.1. Historical development of air transportation in Turkey. Although the development of airline transportation in our country is a new type compared to other types, it has developed rapidly with an acceleration parallel to its progress in the world. Again, these developments in the world have been directly proportional to transportation and economic policies, just like political developments (Karaca, 2015).

Aviation experiments in Turkish history were first made by the Turkish scholar Imam Ismail Cevheri, who was born in the Ghaznavids Period in 1010. Cevheri, by tying the wings like the door he made, threw himself down from the Nishapur Grand Mosque, and as a result of his initiative hoping that he would fly, he went down in our history as our first Turkish air martyr. Our scholar who managed to fly for the first time in our history is Hazerfen Ahmed Çelebi, who lived in the 17th century. Hazerfen Ahmed Çelebi made studies examining the flight of birds in his works, taking Cevheri as an example, and with the wings he developed, he left himself down from the Galata Tower and reached Üsküdar by flapping a bird-like wing before the eyes of all Istanbulites and crossing the Bosphorus. Lagari Hasan Pasha, who lived in the same period and is considered the ancestor of missile, developed an air rocket with a gunpowder chamber. On the birthday of Murad's daughter, it was aired within the framework of celebrations and realized the first air rocket in history. Attaching this mechanism to himself, Hasan Pasha rose 300 meters from the ground and landed on the ground with wings similar to Hazerfen's. Our first certified pilot is Fesa Bey, who received the pilot certificate from the French air club in 1909 (SHGM, 2013; THK, 2015).

Throughout history, planes were first used by Italy in 1911 for war purposes against the Ottoman Empire. As a result of the Italians attacking the Ottoman Empire by air during the Tripoli War, the first works started in an area close to today's Atatürk Airport, just one year later. This is the place where Vecihi Bey, who was later injured in a warplane, came to our history as a result of his treatment and received pilot training. Following this development in the Trablusgarp War, the main reason why the Ottoman Empire failed in the Balkan wars was shown to be the stronger aviation of other countries. Following this situation, an aviation commission was established by Mahmut Şevket Pasha in 1911 and students were sent to Europe for pilot training (Yalçın, 2012 b).

Ottoman aviation, which developed as it was stated until the First World War, became Germany-oriented as a result of entering the world war with Germany. During the war, the support received from the Germans included aviation-related tools and equipment and training in this field. If we examine the developments in aviation field from past to present along with other developments: In 1955 the Turkish Aircraft Society, which would be named the Turkish Aeronautical Association, and the establishment of a glider factory in Ankara (1925), the opening of the aircraft factory and aircraft school in Kayseri (1926), the establishment of the State Administration of Airlines and five aircraft The introduction of postal services through a fleet (1933), Atatürk's establishment of the Turkish bird pilot school and Nuri Demirağ's opening of the first domestic aircraft factory in Beşiktaş (1935), the opening of the İnönü glider camp (1936), Ankara - Etimesgut aircraft factory and parachute towers in Ankara and Izmir provinces and put into operation (1937), the production of the first Turkish passenger aircraft (1938), the signing of the Chicago contract (1945), the opening of the Gazi engine factory (1948), the opening of the airfield office (1949), Civil establishment of aviation department (1954), establishment of Turkish Airlines (1955), establishment of State Airports Authority (1956), preparation and enforcement of civil aviation law I (1983), the enactment of the protocol on the opening of military airports for civil aviation purposes (1986), the introduction of private airlines into the market by granting flight permits within the country (2003) (Korul and Küçükönal, 2003).

By the end of the 20th century, the rapid increase in the number of arrivals of foreign tourists in our country caused many companies to organize trips to our country. In this context, firstly Sun Express in 1989, Pegasus in 1990 and Onur Air in 1992 organized flights to our country. Today, many companies organize trips to our country and the number of companies that organize trips within the country is also increasing. However, as stated in the aviation history in the world, it should be remembered that financial crises directly affect the airline industry; It cannot be denied that the 1998 Far East, 2001 and 2008 financial crises hit the rapidly developing sector in our country. With the crisis experienced in this period, 10 airline companies decided to cease their activities until 2013 (Sarıgöl and Hürtürk, 2009; Kaya, 2016).

THY, Turkey's leading airline company, was established on May 20, 1933 as the first name Airline State Operations Administration. Its name and structure were changed to THY in 1955. Turkish Airlines increased the number of European routes as of 1960. With the modernization of the fleet that started in 1966, an increase in line and flight frequencies was achieved. These efforts continued in the 1990s. In the 2000s, Turkish Airlines positioned its business model as a global airline company based in Istanbul and serving a very wide network. Today, it continues its services as the airline that flies to most countries in the world (Şekerli, 2021, p. 850, Yalçınkaya, 2019; Yurtoğlu, 2016).

2.7.2. Development of civil aviation in Turkey. The most important factor in the development of civil aviation in the world and in Turkey is, of course, globalization. With the globalization, the adoption of free foreign trade understanding and the increase in the mobility of goods and services, the development of tourism, the gradual increase in capital flows and labor movements between countries brought an increase in cargo and passenger transportation, and the airline, along with other transportation alternatives, took its share from these developments. It is known that the development of the aviation industry is directly related to the economy. There is a positive relationship between the income levels of individuals and their preference for air transportation. In addition, while the number of individuals who prefer air transportation in countries with high income levels is high, this number is quite low in individuals living in countries with low income levels (Yüksel, 2014, p. 10). Of course, economic crises, wars and epidemics have a negative impact on the civil aviation sector. While these developments are taking place in the world, the aviation sector in Turkey has grown rapidly in parallel with the demographic, technological and economic development of the country and its weight in the country's economy has increased. The number of airline passengers, which was around 300 million in 1970, increased to 4.3 billion in 2018 with an annual average growth rate of 5.6%. Considering that the world economic growth is 3% on average, these figures are quite a good performance. Likewise, the number of passengers in Turkey, which was 1 million, increased by 12% on average to 115 million. The rate of increase in Turkey is twice the world average. If you pay attention, the rate of increase has increased to 18% by breaking with the AK Party government since 2002. However, due to the corona virus epidemic that started in March 2020, there was a decrease of up to 50% in 2020. If it is necessary to examine the aviation sector, which has followed a fluctuating course until today, in periods, it is possible to distinguish five periods from the Ottoman state to the present.

2.7.3. Civil aviation in the Ottoman period. It is accepted that aviation activities in the Ottoman Empire started in the 17th and 18th centuries. Lagari Hasan Çelebi's invention of the world's first human-carrying rocket by using the thrust of a 7-armed rocket, and Hezerfen Ahmet Çelebi's flying over the Bosphorus in 1632 by jumping from the Galata Tower can be considered as the first aviation activities. Commercial aviation activities in the Ottoman Empire started with the ballooning activities of foreign nationals in the 18th century, and the Polish ambassador İbrahim Pasha became the first Turkish flying in history with his balloon flight in 1789 (Yalçın, 2016, p. 186).

Bebekli Atıf Bey who was born and raised in the Bebek district of Istanbul, was curious about technical tools and invented a type of airplane in 1861. Some parts of the airplane were made of beech wood, which was as thin as cardboard, and parts of it were made of fine hair. While the rotation of the propeller of this aircraft, which has wings, propeller and tail, is provided by foot movement, its balance is provided by the movement of the rudders on the tail and wing. Bebekli Atıf Bey from the garden of a college on 26.06.1861 which coincided with Sultan Abdulaziz's ascension to the throne, put his arms on the wings of the plane, put his feet on his tail, started to spin the propellers of the plane and released himself from the wall of the college. Although Atıf Bey could not rise very much, he fell after gliding about 10 meters in the clay (Göksoy, 2012, p. 58).

The most important event that changed the course of aviation activities in the Ottoman Empire was the air attacks during the 1911-1912 Tripoli War, in which the Italians used 28 airplanes and 4 balloons. With this event, the first air attack in the history of the world, the Ottoman Empire, realizing the importance of aviation, started its first studies in the field of military aviation without wasting time. As a result of this attack, it was understood that activities that were far from scientific and organizational and could not go beyond personal experiences were useless, and official studies were started for the formation of professional airman units in the army. At the same time, the aviation commission was established and in 1912, a facility consisting of two hangars and a small square was built in the area known today as Sefaköy, near Atatürk Airport. Two hangars, 700 meters wide and 1,500 meters long, were built in the area between Ayastefanos (Yeşilköy) and Safraköy (Sefaköy). French R.E.P. Two planes purchased from the company were placed in hangars and the first flight trials were started (Yalçın, 2015, p. 194).

On July 3, 1912, the first Air School was opened in Yeşilköy. It was able to take its place in the aviation world in the same period with developed world states such as England, France, Germany, Italy, Austria, USA and Russia which established military aviation organizations between 1909-1912. However, due to the occupation of Yeşilköy Air Station by the Allied Powers and the looting or usurpation of many materials belonging to the air force, the Ottoman Empire entered a difficult period in the field of aviation. The British asked to evacuate the Yeşilköy Air Station on March 1, 1919, and the air station was evacuated under very difficult conditions and the aviators moved to Maltepe (Milli Savunma Üniversitesi, 2019).

Captain Fesa Bey (Mehmet Fesa Evrensev) is the first pilot of the Ottoman Empire. He became a candidate for the army in 1911, when personnel were sought to train pilots, and he was sent to France for flight training as the first in the exam. When he returned to Turkey in 1912, the number 1 flight badge of the Ottoman Army was presented to Captain Fesa Bey (Yalçın, 2016, p. 197).

Some problems experienced during this period also negatively affected the development of the aviation industry. In 1912, an Armenian-origin industrialist's request to establish an aircraft factory was rejected, and instead of domestic aircraft production, Bristol aircraft from England, Deperdesin from France and Harlan from Germany were purchased. This event is shown as the first example of the preference of imports instead of domestic production in the field of aviation, which has continued from the Ottoman period to the present day. In addition, the training of pilots, carpenters and mechanics, who were sent to training to establish an aircraft school in the French factory, could not be completed due to financial inadequacies and the start of the Balkan War. In 1912, the Aviation Commission requested funds from the state for the army aircraft organization and the aircraft school, and although it was agreed with German, English and French instructors and technicians, the construction of the aircraft school was stopped due to political disagreements (Aksu, 2010, p. 8).

Planes were used for the first time in the Ottoman Empire during the Second World War. It was used for reconnaissance and bombardment during the Balkan War. During the war, First Lieutenant Fethi Bey carried out a reconnaissance flight over the enemy airspace for more than an hour with his plane named “Ottoman” and ensured the detection of new batteries of the enemy. When the Balkan War started, the aircraft companies were ready for active duty in the Ottoman Empire. During the war, there were 17 planes in the use of the Ottoman Empire, but some of these planes were captured by the enemy and some of them were destroyed by the pilots of the planes because they could not be smuggled behind the front. At the end of the Balkan War in 1913, Prof. Dr. The pilot named Ali YAR completed his basic training and was awarded the title of one of the first three aircraft engineers in the world (Aydın, 2011, p. 57–58)

In 1914, the year when the first air mail was carried, the first Turkish technical aviation book, "Vasıta-i Tayyare", was written by the Tayyareci First Lieutenant Mithad Nuri. Hayri Bey and Rıza Bey, who are actually automobile technicians, are Tophane Military. They built a very simple plane in their factory, but they could not fly this plane (Göksoy, 2012, p. 59).

The Minister of War, Enver Pasha, decided to send a fleet of two planes to Cairo in order to make people forget the painful experiences of the Balkan War and to introduce the Ottoman aviation. Fethi Bey and Sadık Bey, Bleriot XI, Nuri and İsmail Bey started their flights with Deperdessine brand aircraft. The aforementioned flight is planned to take 2,515 km and 25 hours in total, consisting of the routes of Afyon, Adana, Homs, Damascus, Jerusalem, El-Ariş, Cairo and Alexandria, respectively, via Eskişehir, departing from Istanbul. The flight in question started from Yesilkoy Istanbul on February 8, 1914. Sadik Bey and Fethi Bey took off from Damascus on 27 February 1914 and continued their flight to reach Jerusalem, but their plane crashed when they came near Lake Tiberias. The graves of Pilot Captain Fethi Bey, Pilot First Lieutenant Nuri Bey and Sadık Bey, who are considered to be the first air martyrs of the Ottoman Empire, are located in Damascus (Nergiz, 2019, p. 17).

With an instruction published on March 6, 1913, a star and crescent was drawn on the lower parts of the wings of Turkish planes to show the country they belong to, and this is the first application in world aviation. During the Balkan Wars, it was decided to collect aid from the public because there were serious financial and moral problems and there was no source to buy planes in the treasury. A campaign was started by Mahmut Şevket Pasha under the name of Tayyare İanesi to create the Ottoman air power and aid began to be collected. The name of the plane, which was bought with the aid collected, was named Ottoman. The plane, which was bought by Serasker Rıza Pasha with his own resources and donated to the army, was named Vatan. The first planes purchased thanks to the aid money collected were given the names "Ordu" and "Meşrutiyet" (Aydın, 2011, p. 56).

The restructuring of the Air Force started in 1914 and the name of the organization was determined as the Teşkilat-ı Havaiye Inspectorate. However, with the start of the First World War, the reconstruction works were interrupted. In 1915, during the First World War, a group of aviators were sent to Germany for flight training. Umur-u Havaiye branch was established separately from the Air Inspectorate. In this period. The Air Force took part in many fronts such as Galicia, Yemen and the Caucasus Ottoman. With the acceptance of the Armistice of Mudros on October 30, 1918, when the First World War ended, and the acceptance of the Armistice of Mudros, a brand new era was entered in the field of aviation as well (Dervişoğlu, 2014, p. 69).

With the acceptance of the Armistice of Mudros, the demobilization procedures started in the army, the German-origin aviators who served as instructors in the Air

Force left the country and the Air Force remained only in name. However, with the outstanding efforts of patriotic aviators, an airport in Izmir, Istanbul and Konya, and an aviation company each in Diyarbakir and Elazig were established with the planes left over from the war. Meanwhile, in Anatolia, the aviators who participated in the War of Independence in order to liberate the country from occupation and regain its independence joined their forces at Konya Airport. The Air Force Inspectorate was abolished, and the Air Force Branch was established by the Turkish Grand National Assembly, which was established on 23.04.1920. In line with this decision, first of all, the damaged planes were repaired, materials were provided under very difficult conditions, and the aviators of the Turkish State carried out their duties on the fronts of the War of Independence without losing hope (Yalçın, 2010, pp. 197-198).

2.7.4. Civil aviation in the period 1923-1950. With the proclamation of the Republic, the whole country was restructured politically and economically, and a separate chapter was opened for aviation. With the newly established republic, importance was given to aviation studies, and in this context, legal and institutional arrangements were made on the one hand, and on the other hand, efforts were made to improve the infrastructure and facility conditions. Aircraft companies moved to Eskişehir in 1925, and the Air School was updated in Eskişehir in the same year. In 1929, piloting training was no longer a course and turned into a school where training lasting 2 years was given. In the first years of the Republic, aviation activities were carried out in two separate areas as civil aviation and aviation industry. The Turkish Aircraft Society, later called the Turkish Aeronautical Association, was established on 16.02.1925. In line with the views and goals of the Turkish Aircraft Society, Aircraft Machinist School was opened in 1928. Students were sent to France and Germany for aeronautical engineering education and an aircraft repair shop was established in Eskişehir. The carpenter's workshop, which was established in Ankara-Akköprü in 1925 for the repair and revision of gliders and powered aircraft, was later converted into a glider workshop (Göksoy, 2012, p. 60).

In the last periods of the Ottoman Empire, there were also foreign airline companies that organized flights to Turkey, especially to Istanbul, in the first period of the Republic of Turkey. In this period, the first air mail was carried out between Berlin and Ankara on 05 July 1924 with a 'Junkers A20W' model airplane.

The cabotage right, which became well established in the sector after the Second World War and occupied the civil aviation sector for many years, was not yet on the agenda in the 1920s. Accordingly, in the 1920s, a foreign company could easily carry out civil transportation between two cities in Turkey. The German Junkers Luftverkehr GmbH company started flights between Istanbul and Ankara in 1925 by obtaining the first civil flight permit in Turkey. The first civil airline company to which the Republic of Turkey gave a concession was the Italian Aero Espresso Italiano. With this concession granted on 01 August 1926, the aforementioned company started its flights between Istanbul and Athens Brindisi (Italy). This was followed by Germany's flag carrier company Lufthansa, and the first air mail flights started on 25 October 1929 between Istanbul and Berlin. Since the Turkish Aircraft Society (February 16, 1925), which was established in those years, existed to serve a very different purpose, it could not play an active role in civil air transportation (Nergiz, 2019, p. 23).

Tayyare Otomobil - Motor Türk Anonim Şirketi (TOMTAŞ) was established in 1925 with the joint venture of the Turkish Tayyare Society (Turkish Aeronautical Association) and the German Junkers company. During the establishment of the said company, Germany, which was defeated in the First World War, wanted to continue its work in the field of aviation by transferring its savings on aircraft manufacturing to Turkey, which is an ally, due to the restrictions under the Versailles Treaty. Within the framework of the agreement, the German Junkers company will produce all kinds of aircraft and engines that the Turkish Aircraft Association (Turkish Aeronautical Association) needs, repair, maintain and repair them and meet all kinds of spare parts. Kayseri Plane and Eskişehir Maintenance Facilities were established to provide all these (Dervişoğlu, 2014, p. 74).

Turkish and German teams worked together at Kayseri Aircraft and Eskişehir Maintenance Facilities, which officially started production on October 6, 1928. This cooperation initiated with Germany. After 1930, it continued with the American origin Curtiss Hawk. It started to manufacture Fledgling and Hawk aircraft. Later, PZL planes were produced with the Poles, Gotha planes with German companies, and Magister planes with the British in the 40s under license. While Kayseri Aircraft Factory finished its preparations for the construction of twin-engine Junkers A-20 fighter planes and was working on the assembly of the planes, the German Junkers company transferred all its shares to the Turkish Air Force on 3 May 1928 due to a problem. Tomtaş, which is a good start for Turkish national aviation, went bankrupt in 1928 due to mismanagement (Aydın, 2011, p. 78).

The aircraft factory in Eskişehir was opened in 1926. In the first years of the factory, an aircraft design called Vecihi-14 was developed by Vecihi Hürkuş, who worked as an aircraft technician, but it was not successful. The facility then continued its activities as Eskişehir Maintenance Facilities. Today, it continues to work as the 1st Supply and Maintenance Center of the Air Force (Dervişoğlu, 2014).

In 1932, an agreement was made with the American Curtis-Wright group. Within the scope of the agreement, it is planned to purchase passenger and warplanes from the company. At the same time, within the scope of the agreement, it was decided to assemble the aircraft belonging to Curtis-Wright at the factory in Kayseri. The factory, within the scope of some additional agreements made in the continuation of this agreement, II. Until the start of World War II, it undertook the construction of a total of 112 aircraft, including the German Gotha 145 and the British Miles Magister. In 1939, the aircraft production, maintenance and repair rights of the factory were transferred to the Turkish Air Force (Aydın, 2011, p. 78). However, due to the American aid that started to come from the Second World War, aircraft production was stopped and new production projects could not be started. Aircraft maintenance and repair works continued at the facilities of the factory, and it was transformed into Kayseri Air Supply and Maintenance Center in 1950 (Bocutoğlu and Dinçarslan, 2014, p. 161).

2.7.4.1. Vecihi Hürkuş. Born on January 06, 1896, Vecihi Hürkuş, one of the most colorful figures in the history of civil aviation in Turkey, flew 30,000 hours with a total of 102 different planes. Sergeant Pilot Vecihi Hürkuş, who showed great success during the First World War and the War of Independence, drew the design of his first aircraft, which he named 'Vecihi K-6', in 1918. Vecihi Hürkuş, who was interested in aviation from a young age, graduated from mechanic school. Vecihi Hürkuş, who served in the Baghdad Front as an aircraft mechanic in World War I, was injured in a plane crash and returned to Istanbul. After he entered the Aircraft School in Yeşilköy and became an airplane pilot, he was appointed to the 7th Aircraft Company of the Caucasian Front in the autumn of 1917. He broke new ground by shooting down an enemy plane in the Caucasus Front. Vecihi Hürkuş whose plane crashed and was injured during an air war, was captured by the Russians and sent to Nargin Island in the Caspian Sea. He managed to escape from here with the help of Azeri Turks and returned to Turkey. He was first appointed to the Istanbul Air Defense Division, and then joined the War of Independence. Vecihi Hürkuş , who made the last flight of the War of Independence, bombed the Izmir airport from the air, making it impossible for the Greek occupation forces to use the airport, and thus was awarded the Medal of Independence 3 times. Utilizing the engine parts left behind by the Greek Army, he manufactured his first aircraft, the Vecihi K-VI, and made its first flight on January 28, 1925. However; When he was punished for flying without obtaining the necessary permissions, he resigned from the Air Force and went to Ankara to join the newly organized Turkish Airplane Society (Turkish Aeronautical Association) (Tayyareci Vecihi Hürkuş Museum Association, 2019).

Selahaddin Reşit Alan, one of the first aircraft engineers of Turkey, sent to France by the Turkish Aircraft Society for aircraft engineering training, returned to the country after his training in France, and worked with Vecihi Hürkuş on the MMW-1 type trainer aircraft he designed in 1935. The prototype of the aircraft was completed in 1932. The project was interrupted before the flight tests of the aircraft, which had a flight time of 2.5 hours and a speed of 200 km/h, and some parts of which were produced in the factory in Kayseri, were not concluded yet. Vecihi Hürkuş produced his second aircraft (Vecihi XIV) at its place in Kadıköy in 1930. Vecihi made her first flight in Kadıköy-Fikirtepe on September 16, 1930.

Hürkuş flew to Ankara from here and performed a demonstration on the city. Prime Minister İsmet İnönü and some generals inspected the plane and congratulated Vecihi Hürkuş. However, Vecihi Hürkuş 's application to the Ministry of Economy in order to obtain the airworthiness certificate for this aircraft, which was produced and accepted as the first in Turkey, was met with the answer on 14 October 1930, "As there was no one to determine the technical qualifications of the aircraft, the required document was not given". In fact, it is thought that Vecihi Hürkuş's maverick behavior is behind the lack of permission. The fact that the necessary authorities were not informed while manufacturing the aircraft and that the aircraft was flying between Istanbul and Ankara without being inspected was found to be contrary to the terms of the Seyrü Sefer-i Havai Decree in force at that time (Bocutoğlu and Dinçarslan, 2014, p. 161).

Thereupon, Vecihi Hürkuş, in order to get the necessary approval, on 06 December 1930. He went to Prague, the capital of Czechoslovakia. After the necessary controls and flights, the Czechoslovak authorities gave the necessary permission on April 23, 1931. Vecihi Hürkuş took off with his plane on April 25 and arrived in Turkey on May 5. Vecihi Hürkuş, who met with the Postal Administration so that the plane would not be idle, planned to operate between Ankara-Erzurum and Ankara-Istanbul. Vecihi Hürkuş founded the first Turkish civil aviation school on April 01, 1932 in Istanbul-Kızıltoprak under the name of 'Vecihi Civil Aircraft School'. A total of 12 students, ten boys and two girls, were enrolled in the school. Education and training began on September 27, 1932. A year or so later, 5,000 TL was given by Nuri Demirağ and an airplane was requested to be built. Upon this request, the "Vecihi KXVI" type cabin aircraft, named "Nuri Bey", was manufactured in 1933. On 06 October 1933, Vecihi Hürkuş made a test flight with the Vecihi XVI aircraft ordered by Nuri Demirağ. This event also triggered the idea of Nuri Demirağ to build an aircraft factory (Nergiz, 2019, p. 11).

On August 30, 1933, the students of the school and Nuri Demirağ were in the sky of Istanbul. They made demonstration flights with the planes manufactured by Vecihi Hürkuş. The Vecihi Civil Aircraft School was closed towards the end of 1934 due to the lack of state support, the lack of sufficient number of students, various financial difficulties and the lack of equivalence in the diplomas of the students it trained (Aydın, 2011, p. 75).

The Turkish Air Force sent Vecihi Hürkuş to Germany in 1937 to receive engineering training. Vecihi Hürkuş graduated from the Weimar Engineering School after two years of education and was awarded the Aircraft Mechanical Engineering diploma on February 27, 1939. After leaving aviation for a long time, he published an aviation magazine within the scope of the Birds' Association, which he founded in 1947, and also gave training flights here. This unit, which young people showed great interest in, procured a Magister type learning aircraft from the Turkish Air Force in 1948. The Birds' Union, of which most of its members are university students, did not last long (Tayyareci Vecihi Hürkuş Museum Association, 2019).

In the same period, in order to improve the institutional structure of Turkey in the field of civil aviation, the State Airways Administration was established on May 20, 1933, within the framework of the law numbered 2186, and was assigned to establish a civil airline company in Turkey and to carry out airline transportation. Mehmet Fesa Evrensev, the first pilot of Turkey, was appointed as the general manager of the company, which was established under the Ministry of National Defense with a budget of 180,000 TL and 24 personnel. When it was established, the total seat capacity was 28 and it only had 5 small aircraft operating between Ankara and Eskişehir. The Airlines State Operations Administration (HDİI) will first be renamed as the General Directorate of State Airlines and then Turkish Airlines (THY). At the end of the first year, the Airline State Operations Administration carried 460 passengers and 1.112 kg of mail (Yurtoğlu, 2016, p. 305).

With the law numbered 2744 published on May 30, 1935, the Airline State Operations Administration was included in the Ministry of Nafia (Ministry of Public Works). Within the scope of the law numbered 3424 published on June 03, 1938, its name was changed to the General Directorate of State Airlines, and it continued to work under the Ministry of Public Works. Just one year after this, it is seen that the company was attached to the Ministry of Transport, which was then the Ministry of Communications, with the law dated May 27, 1939 and numbered 3613 (Nergiz, 2019, p. 55).

The Chicago Convention, which was signed by many states under the leadership of the USA at the end of 1944, was approved by the Turkish Grand National Assembly with the Law No. 4749 dated June 05, 1945. Thus, the Turkish civil aviation sector showed its intention to act in coordination with the modern trends in the world at the very beginning (SHGM, 2015a, p. 95).

In this context, the General Directorate of State Airlines was restructured within the scope of the Law No. 4770 on the Duties and Establishment of the Ministry of Transport, published on June 27, 1945, and was renamed the General Directorate of State Airlines. Another development that marked 1945 and was one of the turning points for the General Directorate of State Airlines was the purchase of 3 C-47s and 30 DC-3 type aircraft from the USA. The USA, which used thousands of these and similar aircraft throughout the war, wanted to both spread its hegemony in the aviation sector and get rid of these worn-out aircraft by selling them at very cheap prices after the war. A striking point here is that the State Airline Administration Administration did not show respect and interest in domestic production aircraft, although it bought and used British, French, German, American, Polish and Dutch aircraft. In addition, it was understood that the purchased aircraft were used by the American air force in the African deserts for a long time, were worn out and needed maintenance even though they were bought cheaply. With the purchase of these aircraft, the General Directorate of State Airlines has suddenly become the largest airline company in the Middle East with a capacity of 52 aircraft and 845 seats. 1947 was also a milestone and an international flight was made for the first time, and the Ankara-Istanbul-Athens expedition was organized (Nergiz, 2019, pp. 82-86).

2.7.4.2. Nuri Demirağ. After the establishment of the factories in Kayseri and Eskişehir, some private sector companies entered the aviation sector. Nuri Demirağ, one of them, aimed to establish an atelier that could carry out design and prototype studies in Beşiktaş, and an aircraft factory and aviation school that could make mass production in Divriği, Sivas, in 1936. Nuri Demirağ, with the contributions of German experts and Selahaddin Reşit ALAN, established the aircraft workshop in Beşiktaş in 1937 and the Sky Flight School in Sivas Divrigi in 1941, where many pilots and technical personnel would be trained. The facilities, which were used as a study workshop at first, were later transformed into an aircraft manufacturing factory consisting of a foundry, assembly workshop, engine and propeller workshop, technical laboratory and material inspection. Nuri Demirağ also built a flight area, repair workshop and hangars in Yeşilköy, on the land that is now Atatürk Airport. He also had a sled on the coast of Yeşilköy to make it available to seaplanes. The first parachute production in Turkey is also one of the works of Nuri Demirağ (Avşar, 2012, p. 40).

The Turkish Air Force ordered 65 gliders and then 10 training aircraft to Nuri Demirağ's workshop in Beşiktaş. Deliveries of the gliders were made between 1937 and 1938. During this period, the double-seat MMW-1 aircraft, designed by Selahaddin Reşit Alan in Eskişehir, was developed and the design of the Alan-2 aircraft was prepared and 24 units of the NuD-36 were manufactured. In 1938, with the help of German experts and the technical leadership of Selahaddin Reşit Alan, the design of Turkey's first air transport aircraft, NuD-38, a twin-engine and metal-bodied

6-seater passenger aircraft, was initiated. On 13.07.1938, Selahattin Reşit Alan lost his life as a result of the unfortunate accident that took place while he was landing at İnönü Airport with the plane named Nu.D.36, of which he was the test pilot and chief engineer. Following this event, in 1939, the Turkish Air Force unilaterally terminated the contract due to the fact that the aircraft it ordered did not comply with the manufactured design, the aircraft's aerobatic capability was not sufficient and the delivery was not made on time. In the lawsuit filed by Nuri Demirağ against the Turkish Air Force, the court ruled in favor of the Turkish Air Force, despite the experts' report that the accident was not a massacre and that Nuri Demirağ gave a positive report. In addition, a law was enacted to prevent the sale of aircraft abroad. These developments have seriously damaged Nuri Demirağ's activities in aviation. Despite all these negativities, Nuri Demirağ continued his work for a while. During the World War II, the factory established by Nuri Demirağ was given the maintenance, repair and spare parts production of Westland Cysander type aircraft. However, the factory ceased its activities in 1950. In the same period, orders from Spain, Iran and Iraq were blocked by the government. The Sky School was closed and the facilities in Yeşilköy were expropriated to be used as an airport. The remaining Westland Cysander type aircraft were given to the scrap dealer as they could not be transferred (Göksoy, 2012, p. 64).

2.7.5. Civil aviation in the period 1950-1980. II. After World War II, in the period between 1948-1952, the US government's supply of aircraft and engines to Turkey within the scope of Marshall aids damaged the aircraft and engine production of the Turkish Air Force. It is thought that the lack of confidence in domestic production by the administrators of the period played a major role in the inability to receive sufficient orders for the aircraft and engines produced by the Turkish Air Force. In 1952, the aircraft factory belonging to the Turkish Air Force, and in 1954 the aircraft engine factory were handed over to the Machinery and Chemical Industry Corporation. When the Machinery and Chemical Industry Corporation took over the Turkish Air Force facilities, Turkish Air Force.

He continued his work with the Forces. 7 aircraft models named MKEK-1/MKEK-7, one of the old designs of the Turkish Air Force, were designed. MKEK-4 and MKEK-7 trainer aircraft and MKEK-6 basic training glider were produced by the

Machinery and Chemical Industry Corporation. However, the aircraft engine factory switched to tractor manufacturing in 1955 and was transformed into today's Turkish Tractor Factory (TTF). Production at the aircraft factory was stopped in 1959, maintenance and repair works continued until 1965, and tractor production started after 1963. In 1968, the factory was transformed into the Machinery and Chemical Industry Institution Textile Machinery Factory and later closed down (Bocutoğlu and Dinçarslan, 2014, p. 164).

After the Second World War, in parallel with the atmosphere of change that affected Turkey's politics and economy, there were some international developments in civil aviation. In 1947, Pan American Airlines started scheduled flights to Ankara-New York, Ankara-London, Ankara-Gander (Canada), Ankara-Limerick (Ireland) as of 20 February, and this was followed by British European Airways' London and Ankara and Ankara flights on 22 May 1947. He followed the expeditions he started between Istanbul. Carrying around 75-80 thousand passengers between 1945-1950, DHY entered into a rapid development in parallel with the economic revival experienced with the coming to power of the Democrat Party in Turkey.The Democratic Party wind also accelerated the activities of DHY and in 1950, 86,331 passengers were carried. The year 1956, when the company was transformed into a joint stock company, was closed with a record number of 218,806. In the same year, the amount of mail carried was 211.800 tons and the amount of cargo was 2.509 tons. While domestic flights spread all over the country, international flights started to be organized to Beirut, Nicosia and Cairo as well as Athens (Nergiz, 2019, pp. 101-103).

In the face of the rapid acceleration of world civil aviation with the effect of technological inventions in these years, the Department of Civil Aviation was established under the Ministry of Transport in 1954 in order to supervise civil aviation activities, conduct international relations in the best way and protect national interests. Later, this institution was restructured as the General Directorate of Civil Aviation in 1987 according to the conditions of the period (SHGM, 2015a, p. 95). The General Directorate of Civil Aviation is responsible for the supervision of the entire civil aviation structure in the country, and is tasked with licensing the personnel working in the aviation sector, licensing for aviation activities, coordinating all flight activities within the country's airspace with the Ministry of Foreign Affairs, Turkish Armed Forces and the General Directorate of State Airports Authority. (SHGM, 2009, p. 18).

As part of the investment moves in the 1950s, the new international terminal of Yeşilköy Airport was opened on 01 August 1953. On 06 August 1954, a jubilee with the name of "Turkish Aviators' Day" was held at Yeşilköy Airport to celebrate his 40th year of service, on behalf of Vecihi Hürkuş, who was advertising with his aircraft for some different brands in 1952. However, Vecihi Hürkuş's passion for aviation continued.On November 29, 1954, he founded Hürkuş Airlines, Turkey's first private civilian airline company, and acquired eight of the planes that Turkish Airlines did not use on its flights, thanks to the loan he obtained from Ziraat Bank. Unfortunately, this new company could not fly due to various reasons. After this unsuccessful attempt, Hürkuş, with the last plane in its fleet, contributed to the exploration of minerals such as uranium, thorium and phosphate in the Southeastern Anatolia region upon the request of the Mineral Research and Exploration Institute. The last years of his life were very troubled, his debts increased, the insurance costs of his planes, which became unable to fly, and their interest expenses increased his debt even more, and even the small amount of his salary paid to him in return for the services he had done was foreclosed. As a result, on May 24, 1960, Hürkuş Airlines had to end its operations. Vecihi Hürkuş passed away in 1969, breaking new ground in aviation (Küçükerman, 2009, p. 73).

THY, which had 28 aircraft and a capacity of 686 seats at the end of 1955, has carried the flag since 1933 until that date, Turkish Airlines, which was established with a capital of 60 million TL with the Turkish Airlines Incorporation Law No. 6623 published on May 21, 1955. THY was established on February 20, 1956 after the approval of its Articles of Association by the Council of Ministers and officially started its activities on March 01, 1956. The first Chairman of the Board of Directors was Rıza Çerçel, and the first General Manager was Ulvi Yenal. On 04 January 1957, Turkish Airlines joined the International Air Transport Organization (IATA), which was established in 1945, as the 78th member (Yurtoğlu, 2016, p. 323).

Significant developments in the field of civil aviation in the 1950s made it difficult for airports and transportation operations to be managed by a single organization, and efforts were made to manage these two basic activities by separate organizations. In this context, it was decided that airport operation services and aircraft operations would be carried out by separate organizations, and aircraft operating activities were transferred to Turkish Airlines with the Law No. 6686 of 28 February 1956. The remaining activities such as ground handling, airport management, traffic control and communication services were transferred to the General Directorate of State Airports Authority (DHMI, 2015).

Ankara Esenboğa airport was put into operation in 1955, and Trabzon and Konya airports were put into operation in 1956. In August 1957, THY took part as a founding partner in the establishment of Aircraft Service Joint Stock Company (USAŞ). The most important development in 1957 in terms of THY's legal personality was the shareholding of British Overseas Airways Corporation (BOAC), which was the airline company of England with intercontinental flights until 1974. 1959 is commemorated with the London plane crash, which can be described as a great misfortune for THY. The plane, including the prime minister of the time, Adnan Menderes, crashed while landing at London-Gatwick airport, and only 10 of the 24 people on board (including Adnan Menderes) survived (Küçükerman, 2009, p. 400).

In 1959, the Alaşehir, Kütahya, Zonguldak and Kastamonu airports were put into operation. In 1961, the first flight to America was made by crossing the Atlantic Ocean, and jet-powered aircraft were added to the fleet of Turkish Airlines in the 1960s. Established in 1977, Bursa Airlines is Turkey's second private private airline. The company, which operates non-scheduled flights on the Istanbul-Bursa route, was closed in 1980 due to insufficient support from the state (Yazgan and Yiğit, 2013, s. 425).

Due to the oil crisis in 1970, oil prices rose by 150%, and the international economic system contracted rapidly. After this crisis, the activities of environmental organizations, together with the increasing prices, led the manufacturers to produce more environmentally friendly and economical jet engines. As a result of these developments, a more comfortable and more environmentally friendly air transportation option has emerged. In the same year, the Joint Airworthiness Authorities (JAA), which had a total of 42 members, including countries such as Sweden, England, Spain and Turkey, were established by the civil aviation authorities in European countries (Küçükerman, 2009, p. 118).

The oil crisis, which put the world civil aviation into a bottleneck in 1974, and the international tension caused by the Cyprus Peace Operation had a negative impact on the Turkish civil aviation sector. However, the do-it-yourself campaign, which started in the 1970s, accelerated with the embargo imposed by the USA on Turkey, and the Turkish Aircraft Industry Corporation (TUSAŞ) was established in 1973. Except for Bursa Airlines, which was established in 1975 and operates only scheduled flights between Istanbul and Bursa, Turkish Airlines operated in the air transport sector in Turkey until 1983. Turkish Airlines, as the only Turkish registered airline company, has dominated the airline market for a long time, both internationally and domestically. Due to the fact that private sector companies were prevented from entering the airline market, a monopoly structure was formed in domestic flights, while duopoly conditions prevailed in many markets in international flights, monopoly market conditions continued to dominate in some markets (Yıldız, 2007, p. 45).

2.7.6. Civil aviation in the period 1980-2003. It is thought that the development performance of air transport in Turkey in the period until the mid-1980s was not sufficient. In this period, apart from a few exceptions, the airline transportation market was maintained under the monopoly of Turkish Airlines, and civil aviation activities were carried out by the state with restrictive policies. In other words, it can be said that the sector has not been opened to private sector companies yet. In 1980, Turkey abandoned the import substitution development model and switched to an export-based growth model with the January 24 decisions. The role of the state in the economy was reduced, free market dynamics became more active, and structural transformation was initiated in all sectors of the economy. The aviation sector was also affected by these developments and the sector was tried to be transformed into a more liberal structure. With the entry into force of the Civil Aviation Law in 1983, it is accepted that the liberalization period in the sector has begun. In this context, private sector companies have been granted the right to operate airports and air transport on both domestic and international routes for commercial purposes. Thus, the share of private sector companies in the air transport sector has increased day by day and there has been a significant increase in passenger demand and seat supply compared to previous periods (Bakır et al., 2017, p. 155).

With the Civil Aviation Law No. 2920, which came into force in 1983, significant developments were experienced in air transportation, thus paving the way for the development of the Turkish civil aviation sector. In the beginning, there were mistakes in laws and practices with initial inexperience, hastily established makeshift companies soon went bankrupt, security concerns arose, and it became debatable whether deregulation really benefits consumers.

However, after the necessary corrections were made in the relevant legislation and the practices were streamlined, safer and higher quality air transport companies were established. Istanbul Airlines, which started its operations in 1986 and is accepted as Turkey's first private international airline company, has been seen as the first example of this development (Bakır, et al. 2017, p. 155).

With the publication of the Civil Aviation Law No. 2920, the number of private airline companies increased rapidly. However, very few of these companies were able to continue their activities successfully. For example, carriers such as Talia Airlines, Toros Airlines, Akdeniz Airlines, Bosphorus Airlines, Bosphorus Airlines, Sunways Airlines, Haliç Airlines, Tayfun Air, Birgen Air, Sultan Air, Holiday Air, Istanbul Havayolları A. they could not continue their activities due to fluctuations (Göksoy, 2012, p. 69).

The name of the Civil Aviation Department, which continues its activities under the Ministry of Transport, was changed to the General Directorate of Civil Aviation (SHGM) in 1987, and necessary updates were made in its organizational structure. Within the scope of the said restructuring, DGCA took on many new duties, authorities and responsibilities. At the same time, private airline companies came together in 1989 and established the Turkish Private Sector Aviation Association (TÖSHID) (Battal et al., 2006, p. 1).

In order to make investments in airports, various physical and socio-economic conditions must be met. It is known that airports built in the past, largely as a result of decisions taken with populist policies, became idle over time or could not be used for a long time, thus causing serious waste of resources. Within the scope of the "one airport for each province" policy, which was initiated in 1988, small airports were built in various provinces in order to improve regional airline transportation. However, over time, it was understood that most of these investments were not economical and some of them were closed in the following years due to insufficient passengers. The civil aviation sector experienced serious adverse events due to the Gulf Crisis that broke out on August 2, 1990 and the ensuing hot war. The rise in insurance premiums and significant increases in reservation and flight cancellations, especially during the hot war period, caused a serious crisis in the sector in 1991 (Bakırcı, 2012, pp. 346-358).

Despite all these negativities, THY also entered the development process with the effect of technology in the 1990s and started to develop its fleet and facilities within a certain plan. In addition, airports began to modernize. In this period, THY concentrated its activities mainly on international routes with high profit margins. This situation contributed to the increase of the fleet and market share of private airline companies in domestic flights. Some companies experienced administrative disruptions because they did not know the sector well, because they were affected very quickly by the crises arising from the inadequate infrastructure and the ordinary structure of the aviation industry, or as a result of political crises, most of the newly established private companies had to terminate their activities in a few years. Despite all the negativities experienced, as a result of the upward trend in aviation on a global scale, the 1990s was a period in which the shares of private companies in Turkey and THY increased in the markets in which they operate (Aksu, 2010, p. 47).

The aviation industry has a very fragile structure and is immediately affected by the slightest negativities, while it has an extremely volatile structure that cannot turn positive situations into its favor at the same speed. It can be affected very quickly by wars and political crises (Gulf crisis), emerging epidemics (Bird flu SARS, etc.) and economic recessions (such as April 5, 1999 and Asian crises). In such adverse situations, the aviation industry may suffer permanent and structural damages, as well as the possibility of being faced with temporary negativities may be very high. In times of crisis, individuals may give up their air travels and immediately turn to alternative means of transportation such as road, rail or sea. The fear of security caused by wars, and the cost-increasing effects of crises in air transport, make themselves felt immediately. In such cases, individuals turn to alternative means of transportation, more precisely to classical transportation methods (Dikyol, 2007).

For example, during the Gulf War, civil aviation activities in many countries, including the USA, were adversely affected. Both the flight safety effect and the rapidly rising fuel costs have inflicted serious injuries on companies. While some companies are affected only periodically and only make a loss, some companies have gone bankrupt and terminated their activities. During the Gulf War period, a higher level of loss was incurred from aviation activities than profits from commercial flights. Turkish Airlines announced a loss every year in the 1990-1994 period, and its total loss reached 520 million USD. THY was only able to make a profit in 1995 and the declared profit amount at that time was 8 million USD. The total loss of the European Economic Area (EEA) member companies of the period in 1992 was around 2.5 billion USD (Aksu, 2010, p. 49).

During the period when the tension between Iraq and Kuwait in the early 1990s turned into the Gulf War, Middle Eastern airline companies also faced crises. According to statistics, the negativity brought by the war could only be stopped in 1992 and a small improvement was achieved. The gulf crisis is not the only cause of the damage explained in terms of the Turkish civil aviation sector, but it is known that the economic crises triggered by the political turmoil in the country in those years also had an intense effect. Considering the losses announced by THY in the relevant period, it is seen that the only reason THY can continue its activities and survive is in the structure of the SEE. It is not considered possible for a company that makes a continuous loss in a 5-year period and does not have sufficient capital accumulation to continue its activities while it is in a private company structure. THY was supported economically by the state, as it is in the structure of a SEE and its activities are of strategic importance, but many private airline companies were deprived of the said state support and had to terminate their activities. THY was able to get through this difficult period, thanks to both receiving state support and its experience in the crisis gained in previous years. However, full development has been seen since 1995, and airline companies have started to make profits by closing their losses. In 1995, there was an average of 6.7% increase in world passenger-freight traffic. In Turkey, there has been an increase of 24.3% in passenger traffic and 17.3% in freight traffic, and this has contributed 14.7% to tourism revenues (Vildan and Küçükönal, 2003, p. 26).

The civil aviation sector, which started to develop after getting rid of the negativities of the Gulf War, was faced with the Asian Economic Crisis, which broke out at a time when it was going to consolidate its growth and start to climb. Due to the Asian Economic Crisis experienced in 1998 in Asia, there was a decline in world civil aviation and even there were companies that terminated their activities. The reflections of this ongoing situation in civil air transportation around the world have also partially affected Turkey. Parallel to the economic crisis, there was a contraction in foreign trade revenues, and this decrease is clearly seen in airline freight traffic statistics. The effects of the crisis that had diminished since 1999 were overcome and an upward trend began in passenger and freight traffic across the world. The upward trend in commercial traffic continued, especially until the second half of the year. While this positive development continued, Turkey fell under its own economic crisis and the destruction of natural disasters. Due to the earthquakes that took place on 17 August and 12 November 1999, the Turkish economy experienced great difficulties. While thousands of people died as a result of these unfortunate and sad disasters, great losses were experienced as a result of factors affecting the economy directly or indirectly, such as destroyed businesses, infrastructure-labor force losses (Aksu, 2010, p. 54).

The terrorist attacks of September 11, 2001, have made their effects felt intensely on the aviation industry all over the world, especially in the USA. The fact that the protests were carried out with hijacked planes dealt a great blow to the aviation industry. In addition to the loss of life and property, air transport has received serious injuries. In almost all parts of the world, freight and passengers have decreased in air transport for a long time. Flights and reservations were canceled after the incident, and travels were not made or postponed except for forced flights.

Many states have implemented special security measures for aircraft coming from abroad due to security concerns. The American government announced that it closed its airspace for three days and announced that only its military aircraft could fly across the country and did not allow civilian flights. Even the routes of the planes in the air were changed and there were returns. From the first moment the incident was heard, the extreme implementation of security measures at the airports caused passenger congestion and delays. The reoccurrence of the delays further increased the extent of the crisis. Most of the planned flights could not be realized. Even the first effect of the attacks could only be overcome after days (Battal et al., 2006, p. 2).

In Turkey, where the wounds of the 1999 earthquake were healed, the civil aviation sector, which started to recover gradually with the year 2000, entered a new bottleneck due to the economic crisis in 2001 and the terrorist attacks of September 11, and serious decreases were experienced in passenger and cargo traffic. In order to overcome this crisis, airline companies in Turkey have begun to take measures such as downsizing in their fleet structures, staffing, closing some lines and reducing flight frequency on some lines. The Gulf war, the SARS virus, the economic contraction and the increase in oil prices affected the civil aviation sector all over the world. While an increase of 5.1% is expected in passenger traffic for 2001, a decrease of 2.1 percent and an increase of 5.4 percent in cargo traffic are expected, while an increase of 7.7 percent is expected (Yüksel, 2014, p.9).

In general, the decline in the Turkish civil aviation sector continued in 2002 as well. Domestic commercial flights decreased by more than -10% compared to the previous year. The number of passengers carried decreased by 13.5% to 8.7 million. On the other hand, domestic freight transport increased by 6% and helped to compensate for the losses (Aksu, 2010, p. 72).

From the perspective of Turkish Airlines, the September 11 crisis exhibits contradictions. The company, which made loss upon loss in various periods, survived this period almost undamaged. Turkish Airlines has been more successful in overcoming this crisis as it has been operating in the shadow of continuous economic crises. It has emerged successfully from the crisis by canceling some lines, reducing its flights and taking additional measures. In the post-September 11 period, in 2002, with a fleet of 66 aircraft, it carried 10.4 million passengers with flights to 26 centers in the country and 77 centers abroad. Even though there was a loss of passengers of around 6%, it was able to generate an income of 84 million USD. In 2002, only 52.5 million USD from the technical services provided by the technical department to foreign companies. provided income (Sarıbaş and Tekiner, 2015, p. 27).

Since the aviation sector was not yet open to competition in 2002, Turkish Airlines operated domestic scheduled flights from only 2 centers and 25 destinations.

Due to the high ticket prices and the economic crisis in Turkey, the number of passengers carried in the airline sector, which is seen as a luxury, could not exceed 9 million on domestic lines. Due to the low demand in air transport, the flights made by Turkish Airlines and 13 other airline companies that organize non-scheduled flights were insufficient. Despite having the necessary infrastructure and capacity, the existing airports could not be used effectively and efficiently due to commercial concerns (SHGM, 2009, p. 24).

2.7.7. Developments after 2003. A number of positive factors such as the economic stability experienced in Turkey after 2003, the decrease in inflation rates, the rapid increase in national income, the achievement of the desired level in economic development and democratic reforms have also directly affected the aviation industry. In this context, there was a 280 percent increase in passenger traffic during the 2003-2012 period, and the number of passengers at the airports reached 130 million from 34 million. The fact that the state support in the civil aviation sector was not provided to private airline carriers until the 2000s made it difficult for companies to continue their activities in the sector, especially in times of crisis, and even caused them to go bankrupt, as was the case with Istanbul Airlines. For this reason, priority has been given to the necessary legal and structural arrangements within the Ministry of Transport for the restructuring of the civil aviation sector in Turkey and the development of private airline companies, especially operating in the field of tourism (SHGM, 2017, pp. 51–55).

After the Gulf Crisis, SARS and September 11 attacks, one of the biggest problems and shortcomings of the Turkish airline industry is that the domestic airline market could not be liberalized until 2003. Law No. 2920 allowed private sector companies to enter the domestic airline market, but some restrictions were imposed on domestic flights in the following years.For example, between which cities (lines) airline companies can organize flights, and which ones they cannot, is subject to the evaluation of the Ministry of Transport. In the second half of the 1990s, when the privatization of Turkish Airlines was on the agenda, private airline companies were not allowed to organize scheduled flights on the lines on which Turkish Airlines operated, with a circular issued. However, with a new decision taken by the Ministry of Transport, Fly Airlines started to organize flights between Istanbul and Trabzon on

October 20, 2003, for the first time, within the scope of the liberalization trend towards domestic airline transportation (Battal et al., 2006, p. 2).

The domestic market, which had been monopolized only by THY until this date, was opened to competition with the liberalization in 2003. The companies that made the first flights were Onur, FLY and Atlas Airlines. These companies, which are too small to be compared with the state institution Turkish Airlines, have not only created a new market, but also avoided being lost in the shadow of a giant like Turkish Airlines, by organizing flights to the cities where the idle airports are located, with the support of the Ministry of Transport (Gökırmak, 2014, p.5).

2003 is considered a milestone in the civil aviation sector, especially within the framework of regional aviation policy. The civil aviation industry has entered a period of rapid growth since the target "Every Turkish citizen will board a plane at least once in their lifetime".The competition that emerged as a result of the said growth was reflected in the services of almost every business operating in the sector, new products and opportunities were offered to the passengers, and traveling by air ceased to be a luxury and became attractive. Other private airline companies, which were allowed to organize scheduled flights on domestic lines, started to provide services to many destinations in the country, especially from Istanbul, apart from Turkish Airlines. With the inclusion of private airline companies in the domestic airline market, the growth in passenger traffic was 58% in 2004 and 38% in 2005. Although the share of private airline companies in domestic flights increased to 30 percent in terms of passenger traffic in 2004, the growth of the market enabled Turkish Airlines to reach 15 percent growth in passenger traffic (SHGM, 2009, pp. 28-30).

2.8. Slot Application Principles

The directive was published on 23.08.2005, and the DGCA Slot Coordination Center was established in order to make optimum use of the airport capacities, taking into account the 24/7 working principle at airports with heavy air traffic, taking into account the balance as much as possible. The said center started its activities in the first half of 2006 in Istanbul Atatürk Airport International Terminal. Slots are used in Turkey, especially in Istanbul, Ankara Esenboğa, Antalya, Bodrum Milas, Dalaman and Kayseri airports (Battal et al., 2006, p. 4).

Similarly, the Law on the Organization and Duties of the General Directorate of Civil Aviation No. 5431 was published in the Official Gazette on November 18, 2005 and entered into force, with the aim of ensuring the highest level of aviation safety and security, and conducting civil aviation activities in accordance with international rules and standards. and the restructuring of the General Directorate of Civil Aviation has begun. With this issue, the General Directorate of Civil Aviation has been transformed into a public legal entity with a special budget under the Ministry of Transport (Zincirkiran, 2016, p. 3).

2.9. Law No. 5431 and Civil Aviation General

Until 2006, a total of 13 companies obtained licenses from the Directorate General. Atlas, Fly and Onur Air companies, among these companies, have started domestic flights, while some other companies only fly international lines, some of them only carry cargo. By the end of October 2006, the number of companies in the sector reached 20 with an increase of 53 percent. Thanks to this increase, the number of large-bodied aircraft used in passenger transportation, which was 152 in 2002, reached 259 with an increase of 70 percent as of the end of October 2006. With these growth rates in the civil aviation sector, the total traffic increase predicted for 2015 by international organizations (EUROCONTROL and IATA) was reached in 2005. The scheduled domestic flights, which were organized only by Turkish Airlines from 2 centers to 25 points in 2002, were carried out by 5 different airline companies and from 7 centers to a total of 43 destinations in 2008. Again in this period, necessary legal regulations were prepared for air cargo transportation to be carried out by private airline companies other than Turkish Airlines (SHGM, 2009, p. 29).

Various incentive packages have been prepared for private airline companies for the growth of the domestic airline market. Discounts of 50% were provided in some airport expenses (landing, accommodation and service fee per passenger) that companies incur, and the special transaction tax on passenger ticket prices and the contribution to training were abolished. These incentives allowed the domestic airline market to grow and the total number of passengers to increase significantly. The growth experienced in the sector with the regional airline project brought employment and tax increases, and this had a positive impact on the social and economic development of the country. In line with the liberalization in domestic routes, with the entry of new private airline companies into the market, many idle airports began to be used actively, and the number of passenger and aircraft traffic at these airports increased. For example, many airports such as Adıyaman, Uşak and Kahramanmaraş, which have been idle for years, have been brought into the country's economy (Battal et al., 2006, p. 4).

Within the scope of the Build-Operate-Transfer Model, the terminal buildings of Antalya, Ankara Esenboğa, Dalaman and Izmir Adnan Menderes airports were completed and started to serve in 2007. In addition, as a result of the intensive studies initiated in 2007, Eskişehir Anadolu University became the first university to have an Airport Operation License (SHGM, 2009, p. 101).

In order to cope with the increasing competition after the liberalization in the civil aviation sector, airline companies started to prioritize the management of customer demands, passenger and cargo capacity. These concepts, defined within the framework of revenue management, were first introduced as a result of the liberalization implemented in the US civil aviation sector in the late 1970s. In order to compete with low-cost airline companies operating in the civil aviation sector, revenue management techniques have started to be used. Revenue management is a holistic and systematic technique designed to increase the income per seat or the occupancy rate on the aircraft, and to obtain the highest income with the current capacity. In the relevant period, this technique, which was seen only in international flights in Turkey, started to be applied in domestic flights with the liberalization of domestic lines. Turkish Airlines started to apply the "Dynamic Revenue Management" technique in domestic passenger ticket prices as of 01.11.2005. In this new system initiated by THY, purchasing the ticket at an early date, important days in the round-trip dates (holidays, beginning of the year, etc.), departure time of the aircraft, high or low season parameters were effective in determining the ticket prices. THY has made it possible for passengers to travel at affordable prices with promotional prices applied in certain periods (Battal & Yılmaz & Ateş, 2006, p. 4).

The civil aviation sector in Turkey has made significant progress not only quantitatively but also in flight safety and aviation security. With the recent legislative updates, significant developments have also been achieved in the execution of activities in accordance with international civil aviation standards and rules. Turkey is at a level above the general average of ICAO member countries in terms of meeting the 8 international criteria (Legislation, Organization, Certification, Operation, Airworthiness, Accident Investigation, Air Navigation Service, Airports) determined to enable the implementation of flight safety (SHGM, 2017, p. 51).

Turkey has been entitled to receive the accreditation for the authorization of maintenance organizations, which even all EU countries do not have yet, on January 22, 2008, as a result of the inspections and legislative studies carried out by EASA (European Union Aviation Safety Agency) in 2007. Thus, all inspections of aircraft maintenance companies operating in Turkey and requesting authorization on EASA Part-145 have been started to be carried out by DGCA on behalf of EASA (SHGM, 2009, p. 115).

The developments in the civil aviation sector and the changes and indicators in the world show that Turkey will be a very important center of the world aviation in the near future. While there was a 5.7% growth in the world in the civil aviation sector during the 2002-2015 period, this rate was 13.7% in Turkey (SHGM, 2017, p. 51).

In Table 2, the companies in the sector and their physical conditions are given. As can be seen, the largest company in the civil aviation sector is Turkish Airlines, which is a public company. With 324 aircraft, it outperformed its closest competitor, the private sector firm Pegasus. Pegasus ranks second with 84 aircraft in its fleet. If you pay attention, only Turkish Airlines constitutes 60% of the country in terms of the number of aircraft, and 75% together with Pegasus.

Table 2. Airlines Aircraft Fleet Statistics

Company	Passenger/Cargo	Flight Type	Flight Number	Total
THY A.O.	Passenger	A330-200	18	361
		A330-300	40	
		B777-3ER	33	
		B787-9	11	
		B737-900ER	15	
		B737-9 Max	1	
		B737-800	84	
		B737-700	1	
		B737-8 Max	11	
		A321 NEO	15	
		A319-100	6	
		A320-200	15	
		A321-200	68	
		B737-800WL	18	
	Cargo	B777-F	8	
		Wet Lease	7	
		A330-F	10	
PEGASUS HAVA TAŞIMACILIK A.Ş	Passenger	B737-800	39	84
		A320	43	
		A321	2	
GÜNEŞ EKSPRES HAVACILIK A.Ş.	Passenger	B737-800	53	53
ONUR AIR TAŞIMACILIK A.Ş.	Passenger	A320	8	27
		A321	8	
		A330	11	
ATLASJET HAVACILIK A.Ş.	Passenger	A319	1	16
		A320	3	
		A321	9	
		A330	3	
TURİSTİK HAVA TAŞIMACILIK A.Ş.	Passenger	B737-800	13	14
		B737-8 MAX	1	
HÜRKUŞ HAVA YOLU TAŞ. VE TİC. A.Ş.	Passenger	A320	9	9
TAILWIND HAVAYOLLARI A.Ş.	Passenger	B737-400	5	5
MNG HAVA YOLLARI VE TAŞIMACILIK A.Ş.	Cargo	A300	5	6
		A330-F	1	
ACT HAVA YOLLARI A.Ş.	Cargo	B747-400	5	5
ULS HAVAYOLLARI KARGO TAŞ. A.Ş.	Cargo	A310-F	3	3
TOTAL				**546**

Source:(SHGM, 2020a)

Passenger and freight traffic at airports in Turkey between 1960 and 2018 in 5-year periods is given in Table 3.

Table 3. Total Passenger and Freight Traffic at Airports

	Passenger (Piece)			Load (Ton)		
Year	**Domestic**	**International**	**Total**	**Domestic**	**International**	**Total**
1960	528 846	184 371	**713 217**	8 306	4 696	**13 002**
1965	681 623	296 290	**977 913**	9 594	8 820	**18 414**
1970	1 661 890	1 017 249	**2 679 139**	24 249	19 790	**44 039**
1975	2 599 373	2 201 529	**4 800 902**	37 778	49 864	**87 642**
1980	1 621 998	1 836 167	**3 458 165**	32 231	43 211	**75 442**
1985	3 061 822	3 261 626	**6 323 448**	47 254	85 828	**133 082**
1990	5 347 723	8 282 242	**13 629 965**	99 549	201 854	**301 403**
1995	10 347 528	17 419 851	**27 767 379**	171 552	405 368	**576 920**
2000	13 339 039	21 633 495	**34 972 534**	226 356	570 271	**796 627**
2005	20 502 516	35 042 957	**55 545 473**	315 858	933 697	**1 249 555**
2010	50 575 426	52 224 966	**102 800 392**	554 710	1 466 366	**2 021 076**
2015	97 041 210	84 033 321	**181 074 531**	871 327	2 201 504	**3 072 831**
2016	102 499 358	71 244 179	**173 743 537**	857 335	2 219 579	**3 076 914**
2017	109 511 390	83 533 953	**193 045 343**	884 810	2 596 401	**3 481 211**
2018	112 911 108	97 587 056	**210 498 164**	886 025	2 969 206	**3 855 231**

According to Table 3, the total amount of cargo, which was around 13 thousand tons in 1976, exceeded 75 thousand tons in 1980 and approached 4 million tons in 2018. Likewise, the number of passengers increased from 700 thousand people in 1960 to 210 million in 2018 with an annual average increase of 11% due to factors such as Turkey's economic growth, greater opening up to foreign countries, the development of the tourism and aviation sector, increasing competition in the aviation sector and benefiting from technological opportunities.

2.10. Story of Turkish Airlines

The story and development process of Turkish airlines is given below (THY, 2022a);

- Turkish Airlines started its journey as Turkey's first aviator and chief executive, Fesan Evrensev with five planes almost 30 employees on May 20, continues today as the airline flying to the most countries in the world on celebrating 87th year.

- It conducted first overseas flight, from Istanbul to Athens in 1947, in 1951, fleet increased to 33 aircraft and began to fly to Nicosia, Beirut and Cairo as new destinations.
- Turkish Airlines name take in 1955, compnay names gained its ranks alongside the members of International Air Transport Association (IATA).
- Istanbul Yeşilköy Airport wrapped up in 1953 and opened to international air traffic. Lately, the airport name conged as Atatürk Airport in 1985.
- Switching from piston engines to jet-powered aircraft by 5 Viscount 794 aircraft joined the fleet in 1958.
- Signature emblem the wild goose designed by Mesut Manioğlu in 1959. He choosed the wild goose because as geese are known to fly up to an altitude of 9,000.
- The Atlantic Ocean crossed on a F-27 aircraft on a 30 hour flight from the USA to Istanbul by pilot captains Zihni Barın and Nurettin in 1961.
- The capital increased from 200 million in 1972 to 400 million.
- The first McDonnell Douglas DC-10 European aircraft was added to the fleet.
- When the date shows 1983, the 50th years it reachedmore than 5,000 employees on 4 continents serving our world-leading brand. Turkish Airlines bridging continents across the globefrom Europe, the Middle East and the Far East and America, delivering 2,5 million passengers.
- Turkish Airlines website was launched in 1998 and call center starts to service in 2001 and e-ticketsin 2003 make easier to buy ticket and check in. Turkish Airlines corporate website launched with a new interface on turkishairlines.com. The website gives the service in English, German, Japanese, French, Italian, Spanish, Portuguese, Korean, China and Russian amongst other languages.
- Miles&Smiles stated in 2000 which provides lots of privileges for customer satisfaction. Turkish Airlines joined Star Alliance which is the global airline confederation in 2008.
- Due to maximize your travel experience, collaborates Turkish Do&Co in order to provides delicious mealsto the passengers by the flying chefs.

- For custommer satisfaction in-flight entertainment system is jam-packed with the latest movies, music, games and more providing our passengers with a pleasant, fun-filled journey. Offer wi-fi service to passengers on board.
- Turkish Airlines have the youngest and most modern fleet in Europe.
- Due to unrivaled flight network, young and modern fleet, comfortable seats and delicious treats, thy have earned the title of the Best Airline in Europe.
- They fly to almost all countries around the world.
- Turkish Airlines has engraved its name with exciting world-renowned sponsorships and advertisements.
- Turkish Airlines fly the most countries in the world more destinations than any other airline. It flies 120 countries from Istanbul Airport. They have 372 aircraft.
- In Turkey it flies 52 airports in 50 cities, in Europa 43 countries 118 airports in 116 cities, in Far East 22 countries 44 airports in 43 cities, in Middle East 13 countries 36 airports in 36 cities, in Africa 39 countries 60 airports in 60 cities and in America 9 countries 21 airports in 21 cities, totally it flies 127 countries, 331 airports and 326 cities according to data of 14.09.2021.
- Turkish Airlines has 27.680 employees in total. They have 581 manager, 5643 pilot, 12.113 cabin crew, 168 technician and 9.175 other personnel and partnership personnel is 35.369 in total. It consist of 4.883 passenger and cargo transportation, 9.864 Maintenance and repair, 387 in flıght production, 20.214 support services and 21 other personnel.

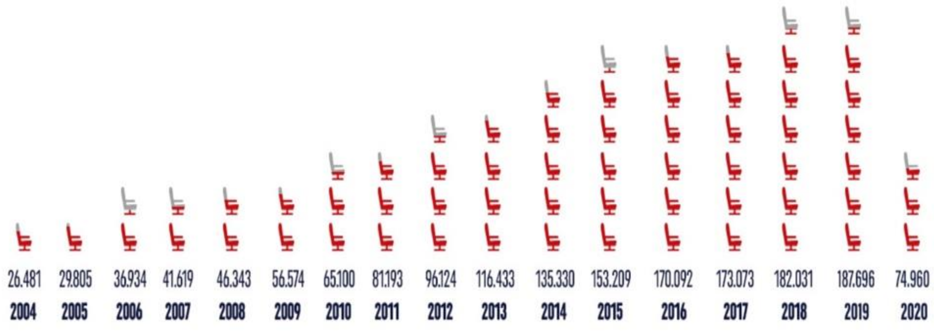


Figure 3. THY Number of Seats (THY, 2022b)

Number of seats of Turkish Airlines was giving on Figure 3. As you may see as altough there was 26.481 seats in 2004 5 years later in 2009 it reaches 56.574

seats. It continue to increase comtiniously in 2012.2014,2015 and 2018. When we reach to 2019 the seat capasity discreas from 187.696 to 74.960 because of Covid-19.

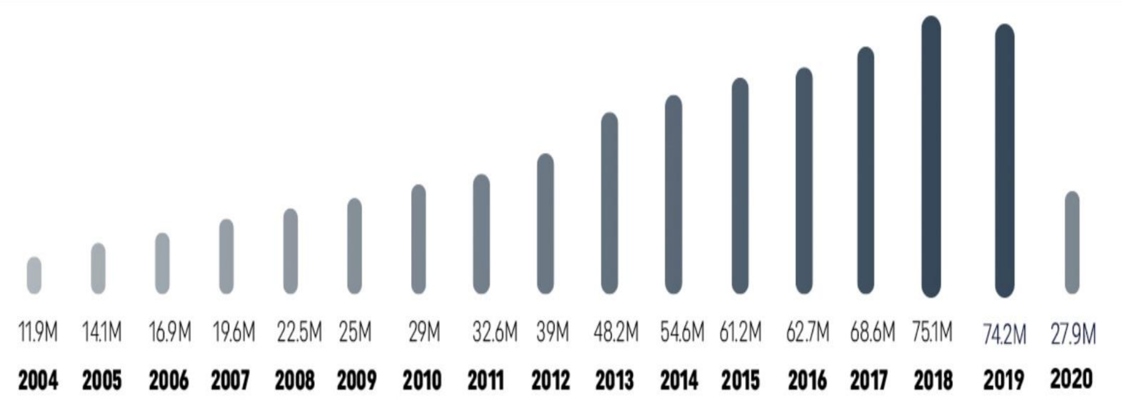


Figure 4. THY Number of Passengers (THY, 2022 b)

Number of passengers of Turkish Airlines was giving on Figure 4. As you may see as altough there was 11.9 million passengers in 2004 5 years later in 2009 it reaches 25 million passengers. It continue to increase comtiniously in 2012.2014,2015 and 2018. When we reach to 2019 the seat capasity discreas from 74.2 million to 27.9 million because of Covid-19.

2.11. National Organizations in Aviation

2.11.1. General directorate of civil aviation. The institutional formation of the civil aviation sector in Turkey started with the State Airline Administration Administration, which was established in 1933 under the Ministry of National Defense. The main mission of this business has been determined as establishing a civil airline company and carrying out transportation in Turkey. In the face of the rapid acceleration of world civil aviation with the effect of technological inventions, the Department of Civil Aviation was established in 1954 under the Ministry of Transport in order to supervise civil aviation activities, conduct international relations in the best way and protect national interests. In 1987, the said department was reorganized as the General Directorate of Civil Aviation according to the conditions of the day. The General Directorate of Civil Aviation operated as the Main Service Unit of the Ministry of Transport until 18 November 2005, however, with the Law No. 5431 on the Organization and Duties of the General Directorate of Civil Aviation, which entered into force on this date, it became financially autonomous and gained its current management structure. Within the scope of this law, 5 regulations and 2 Cabinet

Decisions were prepared and put into effect, thus completing the legal framework. Civil aviation activities in Turkey are carried out in line with the Turkish Civil Aviation Law No. 2920 and the regulations and aviation instructions enacted within the scope of this law (SHGM, 2009, p. 17).

- When the duties, authorities, responsibilities and the framework of the regulations regarding the sector are examined within the framework of the Law No. 5431 published in 2005 (SHGM, 2015a, p. 13).
- DGCA carries out audit activities in order to determine the principles of the legislation in the field of civil aviation and ensure its implementation,
- Arranges and supervises the registration and license processes of civil aircraft, domestic and foreign personnel and legal entities in the country's airspace,
- Determines and supervises the navigation of civil aircraft in the Turkish airspace, traffic communication services, technical qualifications of airports, working principles of training institutions,
- Investigating civil aviation accidents and taking the necessary measures according to the results of the investigation,
- Takes legal action against real and legal persons who act against civil aviation legislation and rules,
- It is understood that it cooperates with international organizations by following the developments in the field of international civil aviation, follows the implementation of international bilateral and multilateral agreements on air transportation and participates in studies related to them.

2.11.2. State airports authority (DHMI). Being the first institutional formation of the civil aviation sector in Turkey, it is also today's forming the basis of the General Directorate of State Airports Authority (DHMI).

Airlines State Operations Administration was established on 20.05.1933. This organization, which was assigned to the Ministry of National Defense, undertook the mission of constructing airports, establishing airlines and air transportation in Turkey.During the said period, some aircraft that were used for military purposes were modified and used for passenger and freight transportation, and air transportation was provided especially in centers such as Istanbul-Eskişehir-Ankara. In line with the importance of airport construction, the Airline State Operations Administration was named within the scope of the law no. 3424 published on June 03, 1938.

Under the name of the General Directorate of State Airlines, it was attached to the Ministry of Public Works and then to the Ministry of Transport with the Law No. 4467 on 21.07.1943. It was transformed into the General Directorate of State Airports Authority (DHMI) with the Decree Law on the reorganization of State Economic Enterprises dated 08.06.1984 and numbered 233, and its main status was determined in the Official Gazette dated 08.11.1984 and numbered 18569. The organization continues its activities as an autonomous SOE, which has a legal personality within the framework of its Main Statute determined by Decree No. 233 published on 08.11.1984, its responsibility is limited to its capital and its activities are autonomous (DHMİ, 2015, p. 13).

When the activities of the General Directorate of State Airports Authority (DHMI) are examined; Air transportation within the scope of civil aviation activities, execution of airport ground services, management of airports, creation and operation of navigation systems and facilities, provision of air traffic control services, establishment and operation of other facilities and infrastructure systems within the scope of these activities, international It is understood that it means the establishment of training facilities in order to train personnel according to the standards, the leasing of the airports in operation and the terminals and other facilities deemed necessary by the private sector within the framework of the build-operate-transfer model from the end of the operational period, and/or transfer of the operating rights to private law legal entities (DHMİ , 2015, p. 13).

General Directorate of DHMI is also a member of the International Civil Aviation Organization (ICAO International Civil Aviation Organization). ICAO was established in 1944 and its main mission is to ensure the stable development of international civil aviation at a global level by developing international rules and policies for flight safety and security.

General Directorate of DHMI, which is a member of ICAO, is also obliged to carry out its duties in accordance with international civil aviation rules and standards. In addition, the organization is a member of many sectoral international organizations, especially the Airports Council International (ACI-Airports Council International) and EUROCONTROL (DHMI, 2014, pp. 20–25).

2.11.3. Ministry of transport and infrastructure. The umbrella institution of the authorities operating in the civil aviation sector in Turkey is the Ministry of Transport and Infrastructure. Until 27.05.1939, transportation and communication services were carried out partly under the Ministry of Economy (Ministry of Economy) and partly under the Ministry of Public Works (Ministry of Public Works), which was established by Law No. 3613 published on that date.

It has been incorporated into the Ministry of Transport. With the regulation made within the scope of Presidential Decree No. 1, which entered into force on 10.07.2018, it was renamed the Ministry of Transport and Infrastructure. In coordination with state institutions, it has been tasked with carrying out studies in order to determine targets, strategies and policies in line with national interests, and to implement these policies and targets.The General Directorate of Aviation and Space Technologies affiliated to the Ministry was also established, and the policy towards aviation and space technologies in line with national interests, in coordination with the relevant government institutions, in the fields of establishment, establishment, development, operation, operation and acquisition of space-related capabilities, He has undertaken duties in the fields of carrying out studies to determine the strategies and targets and implementing the said policies and targets (Ministry of Transport and Infrastructure, 2019).

2.11.4. Turkish aeronautical association. The Turkish Aeronautical Association (THK) was established on February 16, 1925, under the name of Turkish Aircraft Society, approximately 1.5 years after the proclamation of the Republic. The mission of the society in question; To establish the aviation industry in Turkey, to explain the social, economic and political importance of civil aviation to the society, to ensure the development of sportive and touristic aviation activities, to provide the necessary tools and equipment for all these activities and to train the personnel who will work in these activities. In this context, on April 3, 1926, the Aircraft Machinist School was put into service in order to train the technical personnel needed by the aviation industry. The Turkish Aeronautical Association became a member of the International Aviation Federation (FAI), which is the highest level international body in the field of sportive aviation, in 1929, and has been representing Turkey in air sports, at home and abroad, since then. It became a member of the International Air Student Exchange Organization, which was established in 1947, in 1953 (Yalçın, 2015, p. 239).

The Turkish Aeronautical Association University, which is the first specialized university in the field of aviation and space sciences in Turkey, was established by the Turkish Aeronautical Association in 2011 in order to meet the increasing need for qualified personnel in the civil aviation sector. The trainings given by the institution are organized according to the legislation and publications prepared by the national and international civil aviation authority. Turkish Aeronautical Association and University operates by focusing on the sustainability and continuous development of the Turkish aviation industry, and the Turkish Aeronautical Association also bears the authority of Turkey's Aviation Federation (Turkish Aeronautical Association, 2019).

2.11.5. Ministry of foreign affairs permanent representation to ICAO. Turkey was elected as a member of the Council for a period of three years at the first general assembly of the International Civil Aviation Organization held in 1947. However, Turkey's candidacy in 1977, 1980 and 1983 could not be completed due to the split of the votes. In addition to the bilateral problems experienced in the civil aviation sector in the 1970s, as a result of the increase in the value of the civil aviation sector on a global scale, the developments in this field in Turkey and the acceleration of forward-looking studies, in order to follow the works of ICAO, of which it is a founding member, more closely. In 1978, an office responsible for ICAO processes was established at the Ottawa Embassy. The said office was elevated to the level of Permanent Representation in 1990. In the council membership elections held on October 4, 2016, Turkey was re-elected to the Council Membership of the 191-member International Civil Aviation Organization (ICAO), of which it was a founding member, after a 66-year hiatus. Consisting of 36 members, the ICAO Council carries out the function of the executive board of the organization. The Council oversees the preparation and implementation of the content of air law, also maintains the order in the civil aviation sector at the global level, and determines the standards to be applied in aviation by considering the technical, economic and environmental effects (TC. Ministry of Foreign Affairs, 2019 b).

2.12. Development of Aviation in Germany and Story of Lufthansa

The development process of aviation in Germany given Table 4 (DLR, 2017).

Table 4. History of German Aviation

Years	Information
1880	Germany aviation history begins with Otto Lilienthal in the late 19th century. He conducted his flight experiments between 1880 and 1896. His significant work Der Vogelflug als Grundlage der Fliegekunst (Birdflightas the Basis of Aviation) was published in 1889. Otto Lilienthal succeeds the first human flight with his single-wing glider in 1891. He died in an accident after completes 2,000 flights.
1897	First research and development on dirigible airships in 1897.
1903	Karl Jatho from Hannover performs the first successful aerial hops with a motorised apparatus unfurtunately he does not manage to control his machine in flight. Meanwhile Wright brothers in the USA made the first motorised flight. Gustav Weißkopf was known as Gustav Whitehead from Leutershausen emigrated to the USA. He is alleged to have completed several flights with a motorised flying machine in 1901.Nevertheless, price goes to the Wright brothers due to there is no photographic or film evidence of completing the first documented motorised flight.
1904	Prof. Ludwig Prandtl drafts his pioneering theory of extremely low-friction flows, which becomes known as the 'boundary layer theory' in 1904.
1908	Foundation of the Modellversuchsanstalt der Motorluftschiff-Studiengesellschaft (MVA, Institute of Model Testing of the Motorised Airship Study Society) in Göttingen in 1907. First closed loop wind tunnel which known as the 'Göttingen-type' wind tunnel. Foundation of the Drahtlostelegraphische und Luftelektrische Versuchsstation Gräfelfing (DVG, (Wireless Telegraphic and Air Electricity Test Station Gräfelfing) by the high-frequency engineer Max Dieckmann in 1908 near Munich.Prandtl is appointed to Germany's first Chair of Aeronautics at the University of Göttingen.
1909	There are three important issue for German aviation. These are: Hans Grade designed an aircraft and engine himself and wins the Lanz-Preis der Lüfte (Lanz Prize of the Skies), Berlin International Aviation Week; opening of Johannisthal Airfield and First International Air Show (ILA) in Frankfurt.
1912	There are three important issue for German aviation in 1912. First one is organisation of the 1st Emperor's Prize for the best German aircraft engine, which leads to the foundation of the Deutsche Versuchsanstalt für Luftfahrt (DVL, German Institute for Aviation Research) in Berlin-Adlershof. Second one is, establishment of the first Reichspost airmail service, which uses airships and aircraft. The last one is Foundation of the Wissenschaftliche Gesellschaft für Flugtechnik (WGL, Scientific Society for Aviation).
1914	Entrepreneurial courage and advances to the forefront of the airship movement by Count Zeppelin in 1914.
1915	Metal aircraft construction beginned to use in 1915. Thus, to meet the increased demands of the War, they decided to build a Modellversuchsanstalt für Aerodynamik (MVA, Institute for Testing of Aerodynamic Models) in Göttingen in the same year. A towing track with tower carriages to measure air forces acting on aircraft is built at the Deutsche Versuchsanstalt für Luftfahrt (DVL, German Aviation Research Institute) in Berlin-Adlershof; the engine test field is also expanded and a propeller test rig is constructed.
1917	Commissioning of Wind Tunnel I at today's DLR site on Bunsenstraße Göttingen by the MVA. Dismantling of the first Göttingen-type wind tunnel at MVA and reconstruction on the new grounds, then named Wind Tunnel II in 1917.
1918	There are three important issue for German aviation in 1918. First one is the world's first commercial aircraftJunkers F 13 was proceed after Junkers J 10 two-seater all-metal reconnaissance aircraft.Other one ise Prof. Ludwig Prandtl publishes his lifting-line theory at the General Assembly of the Scientific Society for Aviation (WGL). It marks his first description of the relationships between airfoil lift and drag, as well as the formation of vortices behind an airfoil. Leading aerodynamic researchers regard it as one of Prandtl's greatest scientific accomplishments. Last one is the Institute for Testing of Aerodynamic Models (MVA) is renamed as the Aerodynamische Versuchsanstalt (AVA, Aerodynamics Research Institute).

Scientists in Germany contributed to the development of aviation in the world. Since the 1990s, the German aviation market has nearly quadrupled. In this context, more than 40 billion Euros of revenue was generated until 2019. Today, The German aviation industry is an important part of the economy (Statista, 2022)

There are important organizations in the German aviation sector. The one of them is Lufthansa. The Lufthansa Group is an aviation group with operations worldwide. It is composed of the segments Network Airlines, Eurowings and Aviation Services. Aviation Services comprises the segments Logistics, MRO, Catering and Additional Businesses and Group Functions. The latter also include Lufthansa AirPlus, Lufthansa Aviation Training and the IT companies. All segments occupy a leading position in their respective markets. As a leading European airline group, the aim of the Lufthansa Group is to take on a key role in shaping the global aviation market and to remain the first choice for shareholders, customers and employees in the future.

The Lufthansa Group generated revenue of EUR 16,811m in the financial year 2021. The Lufthansa Group is composed of the segments Network Airlines, Eurowings and Aviation Services. Aviation Services comprises the segments Logistics, MRO, Catering and Additional Businesses and Group Functions. The latter also include Lufthansa AirPlus, Lufthansa Aviation Training and the IT companies. All segments occupy a leading position in their respective markets. In 2022, Lufthansa has 351 aircraft in its fleet. Lufthansa Group is a leading European airlines with operations worldwide. It plays a leading role in Europe and composed of Network Airlines, Eurowings and the Aviation Services. The Network Airlines segment comprises Lufthansa German Airlines, SWISS, Austrian Airlines and Brussels Airlines. Lufthansa German Airlines also includes regional airlines Lufthansa CityLine and Air Dolomiti as well as Eurowings Discover, the new holiday airline from the Lufthansa Group which started operations in July 2021 and focuses on the touristic segment. In addition to Lufthansa Cargo AG, the Logistics segment includes the airfreight container management specialist Jettainer group and the time matters subsidiary, which specialises in particularly urgent consignments. The Heyworld subsidiary, which specialises in customised e-commerce solutions, and the investment in the airfreight company AeroLogic are also part of the segment. Lufthansa Technik is the world’s leading independent provider of maintenance, repair and overhaul services for civil commercial aircraft. Lufthansa Technik AG serves more than 800 customers worldwide, including OEMs, aircraft leasing companies and operators of VIP jets, as well as airlines (Lufthansa Group, 2020).

The main development process of Lufthansa Airlines given in Table 5. (Lufthansa Group, 2020).

Table 5. History of Lufthansa Airlines

Years	Information
1926	Lufthansa is founded.
1951	The Allies dissolved in 1951, after two years the "Aktiengesellschaft für Luftverkehrsbedarf" (Luftag) with headquarters in Cologne was founded on January 6, 1953.
1954	Luftag bought the name, the trademark, the crane and the colors blue and yellow from the first Lufthansaon August 6, 1954, which was in liquidation at the time, and has since then called itself "Deutsche Lufthansa Aktiengesellschaft" (Deutsche Lufthansa Stock Company). Multiple tasks had to be accomplished by the new airline before it could begin flight traffic: finding and buying suitable airplanes, schooling airline pilots and engineers and training air stewards. Organizational and infrastructural prerequisites for the technical maintenance of airplanes also had to be set.
1955	2 Convair airplanes took off from Hamburg and Munich to commence scheduled air services on April 1, 1955.
1958	Parallel to the development of a European route network, flights to destinations in America, Africa and the Far East were also added shortly after. Since 1958, the red rose has stood for the fulfillment of the highest comfort requirements in First Class on intercontinental routes.
1960	Lufthansa arrived in the age of the jet plane with the acquisition of the first Boeing B707 in 1960. Lufthansa transferred its long-distance operations from Hamburg to Frankfurt am Main and continued to expand its cargo business.
1970	Wide-body aircraft with the latest technology were bought in 1970.
1976	From 1976 the Airbus A300, the first wide-body twin-engine jet for medium distance flights.
1995	Lufthansa Technik AG, Lufthansa Cargo AG and Lufthansa Systems GmbH were transformed into independent companies of the aviation group in 1995.
1997	Lufthansa was privatized in 1997.

2.13. Development of Aviation in Italy and Story of Alitalia

As one of the greatest European powers of the 20th century, Italy was one of the last countries to start commercial aviation. Political instability and geographical factors have affected this situation. In its initial period, the vast majority of air services in Italy were state-owned or subsidized. However, in 1930 Italian aviation ranked third in Europe in terms of passengers carried. During the war, commercial aviation activities were interrupted. In Italy, which resumed commercial aviation operations after World War II, many companies were established to transport passengers. Among them, the two major Italian airlines Aerolinee Italiane Internazionali and Linee Aeree Italiane formed the backbone of the Italian civil air operations until the 1950s, eventually merging into a single airline known as Linee Aeree Italiane (Alitalia) in September 1957 (Singh, 2021; Centennial of Flight, 2022). But, having suffered a financial crisis since 2002, Alitalia was privatized in 2008 but still needed government support. While the airline company, which went bankrupt in 2017, continued its activities with government loans, it went completely bankrupt in 2020 due to the restrictions caused by the coronavirus epidemic, and the company that was established in its place was renamed Italia Trasporto Aereo (ITA) Airlines. ITA, wholly owned by the Italian government, started operations with 52 aircraft, replacing Alitalia. Aiming to increase the number of aircraft to 105 by 2025, ITA employed approximately 2,800 of Alitalia's approximately 11.000.000 employees (Bertoletti, 2022). The main development process of Alitalia airlines given Table 6 (Bertoletti, 2022).

Table 6. History of Alitalia Airlines

Years	Information
1947	Alitalia-Aereolinee Italiane Internazionali operated its first flight on the Turin-Rome-Catania route with a Fiat G-12 on 5 May 1947. It made its first international flight from Rome to Oslo with a Savoia Marchetti SM95 aircraft with 38 passengers on board in July 1947.
1950	The first Alitalia flight attendants, dressed in uniforms designed by Sorelle Fontana, made their first flights. The four-engine DC4 entered service. The airline began serving hot meals that made the Company one of the carriers most preferred by international travelers in 1950.
1957	Alitalia merged with LAI and became Alitalia – Linee Aeree Italiane with 3000 employees and a fleet of 37 aircraft. In the international airline company rankings, Alitalia jumped from 20th to 12th place in 1957.
1960	Alitalia was the official carrier of the Rome Olympics and for the first time carried more than 1 million passengers in one year. The first jets entered service, the new Leonardo da Vinci airport in Fiumicino was opened and Alitalia transferred its operations base here in 1960.
1969	Alitalia modified its logo and aircraft livery: the "Winged Arrow" was replaced by the tri-color "A". Period between 1969-70 The Boeing 747 jumbo jet entered service and Alitalia became the first European airline company to fly with an "all jet" fleet.
1980	The fleet renewal continued with the insertion of the Airbus A300, twin-engine jets with great capacity, and the new MD Super 80 for medium-haul flights, while the B747 Combi became part of the fleet, permitting greater flexibility in passenger and cargo transport in 1980-1982.
1991	The Mille Miglia Program was launched in 1991-1992.
2001	The modern and efficient twin-engine B777 replaced the glorious B 747s on the long-haul routes in 2001-2002.
2009	Alitalia – Compagnia Aerea Italiana operated its first flighton 13 January 2009. The company took over the goods, infrastructures and personnel from Alitalia – Linee Aeree Italiane and absorbed Air One, creating a single airline, leader in Italy in 2009.
2015	Alitalia has begun its operations, an Italian company with a 49% of capital investment from Etihad Airways the flag carrier of the United Arab Emirates on 1 January 2015.
2017	The airline company, which went bankrupt in 2017, continued its activities with two government loans.
2021	Alitalia declared the company bankruptcy after the corona virus pandemic. Alitalia's last flight AZ 1586 was made on 14 October 2021 from the city of Cagliari on the island of Sardinia to the capital city of Rome, while ITA made its maiden flight from Milan Linate Airport to Bari on 15 October 2021 at 7.35 am local time. Instead of Alitalia, ITA(Italia Trasporto Aereo), which is entirely owned by the Italian government, started its operations.

2.14. International Organizations

The operation of the civil aviation sector in a way that meets the expectations, the necessary planning, coordination and control, as well as the desired performance efficiency depends on the effectiveness of the institutional structure and related regulations. Civil Aviation protection of national interests in the sector, achievement of economic goals, international relations making a positive contribution to the sector in a safe, secure, orderly and efficient manner. It is important that the institutional structure works effectively in order for it to work. Civil Aviation National and international civil aviation authorities, which constitute the institutional structure of the sector, are the same. At the same time, it determines the working principles of the sector. The authorities in question Various reports and legislation prepared by the commissions and working groups they have formed gives direction to the sector in this sense.

2.14.1. International civil aviation organization (ICAO). The establishment of the International Civil Aviation Organization (ICAO) dates back to the International Civil Aviation Conference held in Chicago in 1944. Representatives of 54 countries, including Turkey, attended the conference. A convention of historical importance was drawn up by the participating countries at the conference, aiming to promote cooperation and ensure friendship and understanding among the nations of the world. International Civil Aviation Organization (ICAO) civil aviation activities; classified and defined in the main titles such as production, maintenance and repair services of aircraft, airport construction and management services, air traffic and communication services, necessary meteorological support and environmental protection. Considering the Turkish civil aviation legislation and ICAO documents, it is possible to classify civil aviation activities in 3 main groups as flight manufacturing and maintenance and support services (TC. Ministry of Foreign Affairs, 2019a).

As a result of the work completed in Chicago in November 1944, in order to prepare an international regulation for the solution of some technical and political problems in air transportation after the Second World War; The International Civil Aviation Agreement, which was prepared with the participation of 52 country representatives, was opened for the approval of the countries on 7 December 1944 in Washington D.C. This convention, known today as the Chicago Convention and signed by 52 of the 54 countries participating in the conference, has determined the most basic and permanent principles that allow international air transport. In addition to these, it has also enabled the establishment of a private agency that has been conducting inspections in the aviation industry, officially the International Civil Aviation Organization (ICAO), since then (ICAO, 2019 a)

In the preamble of the Chicago Convention, the purpose of the contract; It has been described as the safe (safe) and orderly development of international civil aviation. The most important achievement at the Chicago conference was in the technical field. In particular, the foundations of some rules and regulations regarding air navigation, which is an important part of safe flight, were laid. In this way, the security of air transport has been increased by using a common air navigation system around the world. Due to the general delays anticipated in the ratification of the Chicago convention, an interim ICAO (PICAO) council was formed. The temporary council, which carried out work between 1946-47, was replaced by the temporary council on April 4, 1947, as a result of the sufficient approvals made to the Chicago Convention.

The International Civil Aviation Organization (ICAO) currently has 193 members andoperates according to the United Nations system. The decision-making bodies of the organization consist of the General Assembly and the Council. The General Assembly normally convenes every three years with the participation of all member states. In cases where there is no contrary provision in the contract, decisions are taken by majority vote.

At the General Assembly meetings, all activities of ICAO in the fields of economic, technical and legal cooperation are reviewed in detail, and the units of the organization are guided for their future activities. The Council, which is also accepted as the legislative and executive body, is responsible to the General Assembly and is the permanent organ of the organization. With the change in 2002, the Council consists of representatives of 36 member states elected by the General Assembly for a period of 3 years. During the selection process of the council members, the contribution levels of the member countries to the industrial sector carrying out activities in this field and regional-geographical distribution issues are also taken into consideration, as well as international civil aviation. While determining the 36 members of the ICAO Council, elections are made in three different categories. Category 1; It is defined as the countries that have reached the most advanced level in the field of civil aviation, and a kind of permanent membership is given to 11 member countries (USA, Germany, Australia, Brazil, China, France, Italy, England, Japan, Canada, Russian Federation.) selected from this category. Category 2; It consists of 12 member countries that contribute the most to the civil aviation infrastructure. 3. Category; It consists of 13 countries that meet the basis of regional (geographical) representation (ICAO, 2019b).

Within the framework of the Strategic Action Plan prepared, the areas where ICAO's most important and prominent activities focus and concentrate are global flight safety and security, environmental protection, use of advanced technologies in the civil aviation sector and liberalization as much as possible. The general aims and objectives of ICAO can be summarized in Table 7 (TC. Ministry of Foreign Affairs, 2019 b):

Table 7. Main Objectives of ICAO

Main Headings	Information
Safety - Security	• To ensure the safe and stable development of the civil aviation industry in a global context and scale. • To improve flight safety and security.
Support	• Supporting activities to ensure flight and airport security. • To support the production and operation of air transportation vehicles for peaceful purposes. • To contribute to the development of airlines, airports and air navigation facilities in order to increase efficiency in the international civil aviation sector. • To respond to the global requirements of safe, stable and economical air transport activities. • To strive for the development and renewal of all activities in the international civil aviation sector.
Competition	• To prevent waste that may be caused by unfair competition. • To protect the rights of member countries and to provide equal opportunities to countries within the scope of international airline management, to prevent discrimination among member countries.

Turkey was invited to the Chicago Convention, which was signed on 7 December 1944, and became a founding member of ICAO in 1947, and also served in the Provisional Council of ICAO during 1946-47 and in the First Council during 1947-50. At the 39th ICAO General Assembly held between 27 September and 7 October 2016, with the participation of 172 countries in total, Turkey won the votes of 156 countries and was re-elected as a member of the ICAO Council after 66 years (TR. Ministry of Foreign Affairs, 2019b).

2.14.2. International air transport association (IATA). The International Air Transport Association (IATA), one of the most important global societies of the aviation industry, was established in 1945 in Havana, Cuba. IATA is a trade association that represents 82 percent of the world's total air traffic and includes a total of 290 airlines. In fact, the current IATA is the continuation of the International Air Traffic Association, which was established in 1919, the year the first international scheduled flight was made. IATA started to work on a small scale in the early periods and has grown over time. IATA was limited to only European airlines until the accession of Pan America in 1939. After 1945, IATA gained a more systematic organization and broader infrastructure, and thus started to fulfill its responsibilities around the world. IATA supports many areas in the civil aviation sector and carries out studies for the regulation of the sector's policies on critical aviation issues. The mission of the said association is positioned on three main objectives related to the aviation industry. These are summarized below (IATA, 2019a):

- Representing the airline industry: The Association works to improve the perspectives of decision makers in the airline industry and to raise awareness about the contribution of the aviation industry to the international and global economy. In addition, it carries out the task of defending the rights and interests of airline companies globally against regulations and fees determined by countries.
- Leading the airline industry: With its experience, the Association determines the basic commercial principles for the aviation industry in a global sense. Aiming to simplify the processes in the sector and provide convenience for passengers, the union also aims to reduce costs and increase efficiency.
- Serving the airline industry: Another of IATA's missions is to help airline companies operate in a safe, secure, efficient and economical way within the framework of clearly defined regulations. The Association provides various products and professional support to all its members and stakeholders.

Many airline companies from Turkey including Turkish Airlines, Atlasjet, Pegasus, Onur Air and Sun Express are members of the International Air Transport Association (IATA, 2019b).

2.14.3. European civil aviation conference (ECAC). The European Civil Aviation Council (ECAC), which was established by the Council of Europe to operate in the field of aviation, is a supra-governmental structure. The European Civil Aviation Conference (ECAC) was established in Strasbourg, France in 1955 as an intergovernmental organization with the support of the International Civil Aviation Organization (ICAO) and with the participation of 18 countries with founding member status. Turkey is also a member of the European Civil Aviation Conference, which was established to regulate civil aviation activities between European states. ECAC continues its activities with the personnel support of the International Civil Aviation Organization (ICAO), but with a separate budget structure and independently. The number of member countries, including Turkey, which was 18 in the organization, has reached 44 today with the participation of European Union member and non-member countries (ECAC, 2019).

The European Civil Aviation Conference has close ties with other important institutions and organizations operating in the European aviation sector, such as the European Aviation Safety Agency (EASA) and EUROCONTROL. The main mission of ECAC is; was determined as ensuring the development of a safe, secure, efficient and sustainable European air transport sector. ECAC maintains close contacts with ICAO and the Council of Europe and actively cooperates with the European Union in its activities. Transport in Europe in the European Civil Aviation Conference, consultation and decision-making processes

It provides recommendations to ministries. ECAC aims to harmonize civil aviation policies and policy issues between member states and between member states and countries in other parts of the world in the process of implementing these policies (SKYBRARY, 2019).

While Turkish Civil Aviation General Directorate defines ECAC and its objectives; It states that the main function of ECAC, a regional (European) organization of ICAO, is to develop legislation in the field of aviation security and to carry out security audits in member countries (SHGM, 2019b). On the other hand, in another source, it was emphasized that ECAC is the largest and long-standing aviation organization in Europe and is a part of ICAO (ANCPERFORMANCE, 2019).

In addition to the Transport Ministers' Meeting, which is the highest working body of ECAC, another important working body is the General Managers' Meeting. Various sub-working groups of the European Civil Aviation Conference are working on the following subjects (ECAC, 2019);

- Ensuring the liberalization of air transport in the member states of the European Union,
- Measures to prevent traffic increase in European airspace,
- Regulations for transoceanic flights,
- Arrangements for charter flights,
- Regulations for the protection of the environment (aircraft noises, air pollution, etc.),
- Regulations for European Pilot License,
- Improving flight rules and safety in the civil aviation industry,
- Preventing illegal actions against the civil aviation industry,
- Managing relations with world countries.

2.14.4. European organization for the aafety of air navigation (EUROCONTROL). The European Organization for the Safety of Air Navigation Supporting European Aviation (EUROCONTROL) is defined as the international civil aviation organization consisting of 41 member states. Its core mission is to create an Air Traffic Management and a single European Airspace capable of meeting the needs of today and beyond. The organization in question is trying to find solutions to the possible difficulties encountered in air traffic management with its expert personnel, which is located in more than 4 European countries and their number exceeds 1900. While developing its primary purpose, the European Air Traffic System, EUROCONTROL plans and coordinates short, medium and long-term European air traffic strategies, in collaboration with governments, navigation service providers, civil and military users, the aviation industry, various organisations, airports and other relevant European authorities. is doing. The main activities of EUROCONTROL in this context are; navigation service operations consist of air controller training, strategic and tactical management, airspace control, development of reliable technology and procedures, and collection of air navigation fees (EUROCONTROL, 2019).

The founding agreement of the European Organization for the Safety of Air Navigation was signed on 13 December 1960 by Belgium, France, the Federal Republic of Germany, Luxembourg, the Netherlands and the United Kingdom, and was ratified 3 years later in 1963. The first adaptation of the articles of association was made in 1981. The organization has been in cooperation with the European Civil Aviation Organization (ECAC) since 1986. Since 1993, cooperation with the European Union has been initiated for the implementation of the Single European Sky, which constitutes its basic philosophy. The founding Convention of the Organization was reconsidered in 1997 within this framework. However, with the establishment of the European Air Safety Agency (EASA) in 2002, EUROCONTROL faced the risk of narrowing its jurisdiction and losing its value and importance. After EASA gained a more functional structure in 2009, problems started to be experienced in terms of authority sharing between the two organizations in the field of Air Traffic Management. As a result of this, a transformation process was initiated in the organization as of 2010. Within the scope of this transformation process, which continues today, priority is given to areas such as modernizing EUROCONTROL, reducing the number of personnel, restructuring and reducing costs. Turkey, which became a member of the organization in 1988, is one of the important countries for the organization, thanks to its geopolitical location with intense international traffic. Therefore, while Turkey develops its relations with EASA on the one hand, on the other hand it is sensitive about the continuation of the function of EUROCONTROL (TC. Ministry of Foreign Affairs, 2019a).

2.14.5. Joint Aviation Authorities (JAA). Joint Aviation Authorities (JAA), which is a non-profit operating in the civil aviation sector, was established in 1970 by the European civil aviation authorities, including Turkey. As a sub-organ of the European Civil Aviation Conference (ECAC), the Organization aims to train the aviation industry and its officials for perfect security. The Joint Aviation Authorities (JAA) acted as a platform to exchange information and ideas on current regulatory developments, as well as assisted in establishing advisory services, solutions and training units for the aviation industry. Since the mid-1990s, it has started training processes for civil aviation authorities. JAA has been replaced by the European Aviation Safety Agency (EASA) as of 2010 (JAATO, 2019).

2.14.6. European Union aviation safety agency (EASA). The European Aviation Safety Agency (EASA), established by the European Union in 2002, is an international organization that aims to ensure civil aviation security. The main task of the institution, which functions the same as the Federal Aviation Administration (FAA) established in the USA, is to ensure the monitoring and implementation of valid safety regulations regarding aircraft, flight, production, response, activity within the scope of all kinds of aviation activities within the European airspace. To protect aviation safety and security in Europe.The organization, which also assumed the duties of the Joint Aviation Authorities (JAA) in 2010, is headquartered in Cologne. A total of 32 countries, 28 of which are EU members, have joined the organization. The organization, which is normally only open to the participation of EU member states, has also been attended by countries outside the European Union such as Switzerland, Iceland and Norway, with the agreements made by bilateral or more parties with the EU commission, and with the fulfillment of some prerequisites (EASA, 2019).

Although Turkey does not yet have the status of a member of EASA, it is one of the countries considered as Pan-European partners (PANEP). The initiative in question is a community of European countries that are not members of EASA. The organization works in coordination with these countries on issues such as the implementation of EU air safety rules. The main mission of EASA is broadly defined below (EASA, 2019):

- To ensure that the highest level of common safety is ensured for EU citizens.
- To ensure the highest degree of environmental protection.
- Establishing a single regulatory and certification process among member states.
- Establishing a single domestic aviation market among the member states.
- Working with other international aviation organizations and regulators.

2.14.7. Airports international assembly (ACI). The Airports Council International (ACI), which is the only global trade representative of airports in the world, was established in 1991. As of January 2020, the organization has 668 members operating 1,979 airports in 176 countries. Although Airports Council International (ACI) is a non-profit organization, the main goal of the organization is to promote excellence in airport management. When evaluated in terms of mission, it can be said that the main purpose of the organization is to represent the interests of airports in relations with governments and international organizations such as ICAO. Headquartered in Montreal, Canada, the Council aims to work with regional governments and non-governmental organizations. In addition to this representation, Airports Council International carries out studies for the preparation of airport-specific standards, policies and practices. It provides knowledge generation for the development of these standards globally and provides educational opportunities in different parts of the world (ACI, 2022).

2.14.8. D-8 countries civil aviation working group (D-8 WGCA). Working Group on Civil Aviation (WGCA) of D-8 Countries, by 8 Muslim countries (Turkey, Iran, Pakistan, Bangladesh, Malaysia, Indonesia, Egypt and Nigeria) Prof. Dr. Established under the leadership of Necmettin Erbakan, it was formed under the umbrella of the D-8 Economic Cooperation Organization and aims to cooperate with member countries on civil aviation. The said Organization aims to work together in all matters in the field of civil aviation of the member countries and in the aviation industry. In this context, the D-8 Countries Civil Aviation Working Group; It works to provide an environment for thinking, discussing and evaluating the cooperation potentials, opportunities, challenges, threats, current aviation issues, the latest developments in the sector and issues such as education, security and investment in the civil aviation sector by bringing together government institutions and private sector representatives (D- 8, 2019).

2.15. International Regulations

The rapid entry of the civil aviation sector into a phase of development, especially with the effect of technical developments and globalization in the 1900s, necessitated some regulations in the sector. In addition, the intense use of airlines in international trade and transportation has made it necessary for countries to regulate trade and transportation in this way, to protect and demonstrate their national sovereignty rights in the civil aviation sector, and to determine the legal rights and responsibilities of the parties. For this purpose, in line with the problems experienced in the sector and encountered for the first time, regulations have been started to be made in almost every subject, with the countries coming together under the name of various conferences.

2.15.1. Paris convention on international aviation. At the international Paris Peace Conference, where many treaties that formalized the end of the First World War were prepared, a proposal was presented by the French state that air navigation should be subject to an international convention. The emergence of the Paris Convention on International Aviation started with this idea, and as a result of the acceptance of the idea, three different commissions were established, namely technical, legal and military. The contract, which was prepared as a result of the work of the commissions, was accepted on 13 October 1919. With the Paris International Aviation Convention dated 13.10.1919, which is accepted as the first multilateral agreement in the field of air law, new regulations began to be implemented on issues such as the country of airspace, classification of aircraft, nationality, airworthiness certificate (Gemici and Yeşiller, 2018, pp. 132– 134).

The Paris Convention on International Aviation consists of 43 articles and is divided into sections such as general principles, nationality of aircraft, airworthiness, flight rules, prohibitions, state aircraft and International Commission of Air Navigation (ICAN). The Paris Convention on International Aviation has ended the debate on whether the legal status of the airspace will be free or under the sovereignty of each state. This contract, which entered into force by being signed by 27 states on 11.07.1922, is the first international agreement in the field of civil aviation (Gemici and Yeşiller, 2017, p. 143)

The Paris Convention on International Aviation was amended in 1922, 1923 and 1929. The principle of absolute and exclusive sovereignty in the airspace has been put forward with the expression "Every state has absolute and exclusive sovereignty over the airspace over its territory" in the first article of the convention. With the 2nd article of the Convention, the Contracting States have undertaken to grant each other's aircraft the freedom of passage over their countries during periods of peace, provided that they comply with the specified conditions. With this convention, it is seen that the states parties grant exceptions to the contracting states regarding their sovereignty over the airspace and only provide freedom of passage. Today, according to the generally accepted understanding of international law, all kinds of rights of countries regarding their airspace over their land and territorial waters are accepted as the sovereign right of the relevant countries (Gemici and Yeşiller, 2018, pp. 132–134).

The Paris Convention on International Aviation divided aircraft into civil and state aircraft and decided to allow civilian aircraft to pass through national airspaces harmlessly for the development of aviation. International flights made by planes belonging to the contracting states were excluded from the agreement and it was decided to carry out the relevant flights by obtaining diplomatic permissions. Under the contract, each state will have the authority to determine the corridors to be declared in its national airspace and will be able to close its airspace to flights in time of war. It was decided to establish an international organization at the Paris Peace Conference, since it is inevitable to make new regulations and updates in technical and legal terms, and because each technical equipment acquired causes a different dispute between the states. The International Commission for Air Navigation (ICAN) was established by the contracting states of the Paris Convention on International Aviation in order to adapt civil aviation to technical developments and to carry out the necessary legal and technical regulations (Bilge, 1951, p. 197).

Although 34 countries signed the Paris Convention on International Aviation, two major states of the period opposed it. While the United States Senate opposed an international union, Russia did not attend the Paris Peace Conference. In 1922, Germany abandoned the treaty. Although Turkey committed to join the Paris Convention on International Aviation with Article 100 of the Lausanne Peace Treaty, it did not. Later, the convention was repealed in 1947 with the entry into force of the 1944 Chicago Convention (Wensveen, 2018, p. 461).

2.15.2. Madrid convention. Spain, which did not join the convention on the grounds that it was not given equal voting rights with other states in the Paris Convention on International Aviation, invited 19 Latin American countries and Portugal to the Ibero American Aviation Congress held between 25-30 October 1926 and the Madrid Convention was accepted. Madrid Convention signed by Spain with the South American States, Paris.

Although it was created as a reaction to the provisions contrary to equality in the Convention, it contains provisions similar to the Paris Convention on International Aviation in general terms. This agreement, which was signed for the states that have close economic relations to regulate air transportation, lost its importance after many South American states entered the Havana Convention in 1928 and Spain joined the

Paris Convention on International Aviation in 1935. It was completely ignored with the Chicago Convention and took its place on the dusty shelves of aviation history. The Madrid Convention reinforced the need for an international agreement that covers all states and seeks to meet everyone's needs (Milde, 2008, p. 12).

2.15.3. Havana convention. The contract signed by 20 states in the Americas after the 6th Pan-American Conference convened in Havana between 02-20 January 1928, is also known as the commercial aviation contract. The Havana Convention emerged as an international contract between the states in the Americas. According to the convention, although states accept their absolute and exclusive sovereignty in the air, the difference it shows in certain matters compared to the Paris and Madrid Conventions is that more freedom is given to aircraft used for commercial purposes (Bilge, 1951, p. 197).

The Havana Convention is accepted as the first step towards the liberalization of civil aviation, as it grants the right of all civil aircraft of the nationality of the member states to make commercial flights over the airspaces of the countries included in the contract. The Havana contract gave more freedom to aircraft used for commercial purposes and aimed to find solutions to the technical, infrastructure and operational problems of commercial aviation with private aircraft. Although the Chicago Convention of 7 December 1944 became obsolete, it preserves its place in history as an important step in terms of international civil aviation (Wensveen, 2018, p. 463).

2.15.4. Warsaw convention. Due to the rapid developments in the Civil Aviation sector, the importance of the rules and rules to be applied in the legal relations arising from the passenger and cargo transportation by air, especially in the national or international arena, has increased. The reason for this is that the different interpretations of the terms of the air transport contracts due to the existence of different legal rules in the countries where the transport is made cause great difficulties in the claim of rights of the passengers. The courts in the country where the carriage contract was made, the carriage started, the carriage ended, the stopover and the nationality of the passenger considered themselves competent in the same case and applied different laws, resulted in contradictory and repetitive compensations. These problems had a negative impact on the newly developing and financially weak civil aviation sector businesses. In order to find solutions to all these problems, the Warsaw Convention, which was signed by 30 countries after the Second International Aviation Conference meeting held in Warsaw on October 4-12, 1929, entered into force on 13.02.1933 and currently 108 states have joined the convention (Tarman, 2013, pp. 98–99).

The Warsaw Convention, whose full name is the Convention on the Unification of Certain Rules Regarding International Air Transport, regulates the financial obligations of companies due to possible accidents in air transport. With this contract, carrier companies are held responsible for the death and injury of passengers, damage and loss of cargo (luggage, cargo and mail). Within the scope of the contract, standards were also introduced for the documents used in air transportation. When the idea that the Warsaw convention could not fully meet the needs and that it was beneficial and even necessary to amend it, emerged in a short time among the contracting states, a draft convention was prepared to replace the Warsaw convention in 1952 after the work of the legal committees of ICAO and IATA. However, as a result of the consultations, it was decided to amend the existing contract instead of a new one (Wensveen, 2018, p. 464).

Various amendments were brought to the Warsaw Convention with many additional protocols prepared in the 1955-1975 period. With the law enacted on 01.03.1977, Turkey joined the Warsaw Convention and the Hague Additional Protocol dated 28.09.1955 (Demirkıran, 2007, p. 2).

The most important reasons why the Warsaw Convention has such an important place in civil aviation law are that it is one of the most accepted international conventions for civil aviation law, besides the fact that it is regulated in detail, transport documents, legal relations in the transport of goods (load) and the responsibility of the airline carrier.For this reason, many changes were made in the Warsaw Convention until 1999, but the contract did not lose its feature of being the main source. A draft has been developed by IATA, ICAO and the European Union in order to update the responsibilities and limitations of responsibilities determined in the Warsaw Convention, the provisions on documents and other important articles, and to reduce the complexity due to protocols and protocol amendments. The contract, which took its final form as a result of the studies, was opened for signature by the states participating in the International Air Law Conference held in Montreal between 10-28 May 1999. This new contract, called the Montreal Convention, has replaced the Warsaw Convention in international air transport (Kurtuluş, 2019, p. 12).

2.15.5. Chicago convention. The Second World, which had a tremendous impact on the technical development of air transport a wide passenger and cargo transportation network desired to be established after the war, rapid developments in the aviation sector, new legal regulations and new measures that can solve many political and technical problems have made it necessary to take new measures. In this context, representatives of 52 states, who came together in Chicago, United States of America, on 07.12.1944, signed four agreements at the Civil Aviation Conference. These agreements are the International Civil Aviation Convention, the International Civil Aviation Interim Agreement, the International Air Transport Agreement and the International Air Services Transit Agreement.The International Civil Aviation Convention, called the Chicago Convention, is a basic text that determines the principles of the international civil aviation industry at a global level and determines the general rules of international civil aviation law. This contract includes many rules, including the establishment of ICAO (International Civil Aviation Organization), such as the nationality, registration, license and certificates of aircraft, flight over national airspace, international standards regarding aviation (Bahar, 2018, p. 26).

The Chicago Convention, which consists of 96 articles, to which 152 countries are party and Turkey has ratified with Law No. 4749 dated 05.6.1945, has been updated 8 times in 1956, 1959, 1963, 1969, 1975,1980, 1997 and 2000, after its original version dated 07.12.1944.

The first 3 articles of the Chicago Convention are (TBMM, 1945);

- Sovereignty: “Each state has the right of full and exclusive sovereignty over the airspace of its own country”.
- Country: “What is meant by the territory of a state is the pieces of land and territorial seas under the sovereignty, sovereignty, protection or mandate of that state”. International airspace, on the other hand, is the airspace over places that are not under the sovereignty of any state, such as the high seas, and all states' civil and state aircraft have the right to fly freely in this area.

- State Aircraft: The difference between civil and government aircraft is explained in the relevant article. The Chicago Convention can only be applied to civil aircraft, and the definition of state aircraft is determined as "Aircraft used in military, customs and police services". Aircraft used in fire fighting, coast guard, postal transport, search and rescue, scientific research activities carried out by the state are also considered as state aircraft. However, although they are the property of the states, the aircraft that carry out international commercial transportation by working on their behalf and account are not considered as state aircraft.

The purpose of the convention is included in the preamble and it is stated that it is to support the safe and orderly development of international civil aviation and to establish international air transport service on equal opportunity, healthy and economic foundations.

Within the scope of the Convention, the implementation of customs regulations and national traffic rules to aircraft on international flights, the states to take effective measures to prevent the spread of the disease by air, and the right to reasonable search for incoming and outgoing aircraft are determined for each state. Normal fuel and oil supplies of aircraft are exempted from local customs duties to facilitate air navigation. Each State has adopted standard procedures for airport control, radio services, navigation facilities, use of signals, broadcasting of maps, and the like, to the extent it finds practicable. The convention stipulates that an aircraft operating internationally must carry certain documents such as registration and certificates of airworthiness, licenses for crew members, logbook and passenger or cargo manifest. The signatory states have committed to providing the highest standard in international standards and regulations regarding the following issues (Wensveen, 2018, pp. 465–466):

- Communication systems and air navigation aids, including ground marking
- Characteristics of airports and landing areas
- Rules of air and air traffic control practices. Licensing of operating and mechanical personnel
- Airworthiness of aircraft
- Registration and identity of aircraft
- Collection and exchange of meteorological information.

- Logbooks
- Aviation maps and charts
- Customs and immigration procedures
- Aircraft in distress, investigation of accidents and other issues related to the safety, regularity and efficiency of air navigation

2.15.6. Tokyo convention. The Cordova event in 1947 is the origin of the Tokyo Convention. The passenger named Diego Cordova found himself in attacks on the passengers, pilots and crew on the plane as a result of an argument that broke out while the plane was on the open sea while he was in an excessively drunk state. A criminal complaint was filed with the New York Federal Court, but the case could not be prosecuted because the court did not have a ruling regarding the plane. Upon this and all similar developments, an agenda item regarding the legal status of aircraft was determined at the meeting of the Legal Committee of the Council of the International Civil Aviation Organization (ICAO) in 1950.Although the contract presented by the International Civil Aviation Organization (ICAO) Legal Committee at the conference held in Rome in 1962 was signed in Tokyo, the capital of Japan, on 14.09.1963, it could enter into force in 1969 (Sirmen and Asar, 2008, p. 293).

The purpose of the Tokyo Convention is to ensure and maintain order in the aircraft, to determine the consequences and sanctions of those who disrupt the order, to determine the powers of the captain pilot and in which country the guilty person will be tried, in short, to ensure that the aircraft, passengers and crew complete the journey in a safe and secure manner. According to the convention, when an illegal act or crime is committed in an aircraft, the parties to the convention must cooperate in order to bring the offender under control and to complete the flight safely. Due to the acts, restrictions, sanctions and obstructions to be made in accordance with the provisions of the Tokyo Convention, the captain pilot, crew, passenger, operator or owner of the aircraft cannot be held responsible in any court for the treatment of the person to whom the said sanctions and restrictions were imposed (Çoban and İpek, 2020, p. 97).

Since there was no regulation on flight safety and security in international law prior to this convention, the 26-article Tokyo Convention is accepted as the beginning of the struggle of the states against acts that endanger the security of civil aviation. The contract was accepted by Turkey on 17.04.1975 and ratified by 185 countries including Turkey (Basdemir, 2020, p. 132).

2.15.7. Lahey convention. The fact that the Tokyo Convention does not characterize hijacking as a crime, the increase in hijackings within political terrorist movements, especially in the 1960s, and the inadequacy of the Tokyo Convention in the face of these increasing hijackings led to the need for a new convention in the international arena. The ICAO Law Commission established a subcommittee on the issue of the illegal seizure of aircraft, and this subcommittee drafted a new international agreement on the subject at its February 1969 meeting. The aforementioned draft gained its final form under the name of "Lahey Convention for the Prevention of the Illegal Hijacking of Aircraft" at the conference held on 1-16 December 1970 and was opened for signature by all states (TBMM, 1972).

The main purpose of Lahey Convention is to prevent the increasing number of hijackings, to ensure that these acts are punished by the international community and to have a real deterrent effect. With this convention, the acts considered as crimes were defined precisely, legal gaps were seriously filled and severe punishment of these acts by the countries became mandatory. There is no safe zone left in the world for hijacking and similar crimes. However, the contract also has shortcomings, for example, the lack of a final solution to the hijackings committed for political purposes, because it allows countries freedom in the punishments to be given for these acts, the severe punishment is not clearly explained, the hijackers are granted asylum by some countries, the inability to apply the provisions of the law, including only the crimes committed in an aircraft in flight status, excluding the actions that may take place before the flight or after the flight is completed, not mentioning what should be done or what can be done at the airport, that is, the terminal buildings (Dempsey, 2003, pp. 666-668).

2.15.8. The Montreal convention (1971) and its additional protocols. Particularly in the 1970s, the hijackings' transformation into sabotage acts and armed attacks against aircraft, but the fact that the Tokyo and Lahey Conventions did not include provisions regarding these and similar acts led to the need for another convention that covers these acts. Taking into account the need to fill in the missing parts in the previous contracts that directly affect the security of civil aviation, the

International Air Law Conference was held in Montreal between 8-23 September 1971 under the leadership of ICAO, and then on 23 September 1971 "The Prevention of Unlawful Acts Against the Security of Civil Aviation". The Montreal Convention" was adopted. Turkey accepted the convention held in Montreal with the decision of the Council of Ministers on 22.06.1975 (Tekel, 2011, p. 1357).

New ones have been added to the acts classified as crimes in the Montreal Convention and Lahey Convention. Article 1 of the Convention defines the criminal elements as follows:

- "If he commits a violent act against a person on board an aircraft during the flight, which is likely to endanger the safety of the aircraft,
- Destroys an aircraft in service or in such a way as to render such an aircraft incapable of flightor causes damage likely to endanger its safety in flight,
- Puts or has put in any way a device or substance that is likely to destroy an aircraft in service or cause damage to it in a way that is likely to render it incapable of flight or endanger its safety in flight,
- Destroys or damages air navigation facilities or interferes with their operation and any of these acts are of a nature that could endanger the safety of the aircraft in flight,
- Endanger the safety of an aircraft in flight by providing information that it knows to be false,
- Attempts to commit any of the above-mentioned crimes,
- If the person who commits or attempts to commit any of these crimes is an accomplice, he commits a crime."

The Montreal Convention specifically excluded aircraft used in military, customs and police services. It has been accepted that if the crimes specified in the contract are committed while the aircraft is in service before and after landing, these acts will be considered as if they were committed against the aircraft in flight for the first time.

In addition, according to Article 4 of the Convention, for the implementation of the aforementioned provisions, these crimes must have been committed in the country of another state, or the actual or scheduled landing or take-off point of the aircraft must be located outside the state in which the aircraft is registered. In case the said actions are committed or sabotage actions are undertaken in the country where the aircraft is registered, it is excluded from the scope of the contract (Grand National Assembly of Turkey, 1975).

In the 1970s and 1980s, when it was seen that terrorist activities in the civil aviation field were not limited to hijacking or sabotage actions against aircraft, and terrorist attacks against airport buildings, private passenger lounges and counters were experienced, in addition to the 1971 Montreal Convention, dated 24.02.1988. “Illegal Acts Committed at Airports Serving International Civil Aviation”

Amendment protocols have been prepared for the Montreal Convention on different dates and these are; Amendment Protocol amending Article 56 dated 06.10.1989 and amending Article 50(a) dated 26.10.1990 (SHGM, 2020b).

Despite all the measures taken, terrorist attacks against the civil aviation sector could not be prevented and sabotage, especially using explosive materials, occurred.

A total of 770 people lost their lives in the terrorist acts of Air India in 1985, Pan Am (Pan American World Airways) in 1988 and UTA (Union de Transports Aériens) flights in 1989. It accelerated its preparation by ICAO. The common feature of these terrorist attacks is that they were made with explosive materials. With the Montreal Convention of 1991, which consists of 15 articles and aims to detect explosive materials; Allowing explosive detection technology, placing a marking agent in explosives at the manufacturing stage, establishing a technical commission on plastic explosives, preventing the manufacture of unmarked explosives, preventing the movement of unmarked explosives in their own countries, and complying with the provisions of the convention in their own national laws and relevant National Civil Aviation It has been made mandatory to include them in Security Programs (Şahan, 2010, p.62).

2.15.9. Montreal convention (1999). In particular, the complexity of the implementation of the Warsaw and Lahey Conventions, which determine the regulations regarding the liability of the carrier, and the inability of the provisions regulating the liability of the carrier in particular, to meet the new needs, necessitated the preparation of the Convention on the Unification of Certain Rules for International

Carriage by Air (Montreal Convention) dated 28.05.1999. The Montreal Convention, to which 103 countries are party, replaced the Warsaw and Lahey Conventions. However, the Warsaw and Lahey Conventions will continue to apply for carriages to countries that have not ratified the 1999 Montreal Convention. Turkey signed the Montreal Convention on 28.5.1999 and the contract entered into force on 26.3.2011 (Uzun, 2020, pp. 1-3).

In the Montreal Convention; In the first part, the general conditions, in the second part, the legislation/documentation regarding the carriage of passengers, baggage, cargo and mail and the duties of the parties, in the third part the liability of the airline company and the scope of compensation for the damage, in the fourth part unified transport, in the fifth part by air carried out by someone different from the contracted airline company. Transportation, compulsory practices, insurance and other conditions related to transportation carried out under extraordinary conditions in the sixth section, and the final conditions in the seventh section. Thanks to these comprehensive mergers and updates made with the Montreal Convention dated 28.05.1999, it is thought that sufficient levels have been reached in meeting the needs of international civil aviation regulations (TBMM, 2010).

2.16. Current Status of Airline Transport in the World

The world aviation industry is rapidly changing and developing within the framework of technological developments, new investments and changing international commercial and social structures. Considering the free movement of production factors, the aviation industry is an important international component in providing space and time utility.

The aviation sector is an important factor for economic growth considering its indirect, incentive and catalytic effects as well as its contribution to GNP. Improved airline connections affect the activities of many sectors, including tourism and trade. Especially countries whose economy depends on tourist input and whose resources are tourism-oriented may not be able to achieve the desired economic growth without flight connections (ATAG; 2016: 15). Due to the increase in the total amount of products and services produced and disposable income in a country, region or worldwide, the demand for the airline also increases in the relevant markets (Holloway, 2008: 88). Due to the increase in disposable income, the demand for more costly long distance lines is also increasing. In other words, income elasticity is higher in long distance lines compared to short distance ones. Income elasticity of demand is lower in business travelers compared to those traveling for entertainment purposes (Doganis, 2002: 200).

Air transport is different from other types of transportation with its various features, and the most important of these features is the ability to quickly cover long distances. This feature of airline transportation contributes significantly to economic development and the interaction of different countries. Airway transportation also provides many socio-cultural and economic opportunities to the societies in terms of providing space and time benefits with its technical facilities. In this context, it is an expected situation to have a causal relationship between economic growth and air transport. Although there is an increase in the demand for air transportation due to the increase in the income of individuals in general (Baker et al., 2015; Hakim and Merkert, 2016), it is stated that air transportation and aviation investments also have positive effects on economic growth (Banister and Berechman, 2001; Hensher et al., 2012).

Demand in the world air transport industry has developed in parallel with the growth rate of the global economy in the last 10 years. The correlation between the two series is at the level of 95%. Passenger demand, which increased by 7.4% in 2015, was 6.2% in 2016. Ticket prices, which are cheaper due to oil prices, are the most important factor in increasing the number of passengers. In this context, the number of passengers is expected to increase by 50% in 2035 (Sarsin Kaya, 2016, 8).

The common goal of all countries in the world is to develop their industries, increase trade volumes and employment, and balance income distribution. In this context, air transport has positive effects on economic development. In this context, the situation of the aviation industry in Turkey and in the world between 2010-2019 is evaluated below.

When an evaluation is made in terms of Turkey, while domestic flights were realized from 2 centers to 26 destinations in 2003, today there are flights from 7 centers to 56 destinations with 5 airlines (Figure 5).

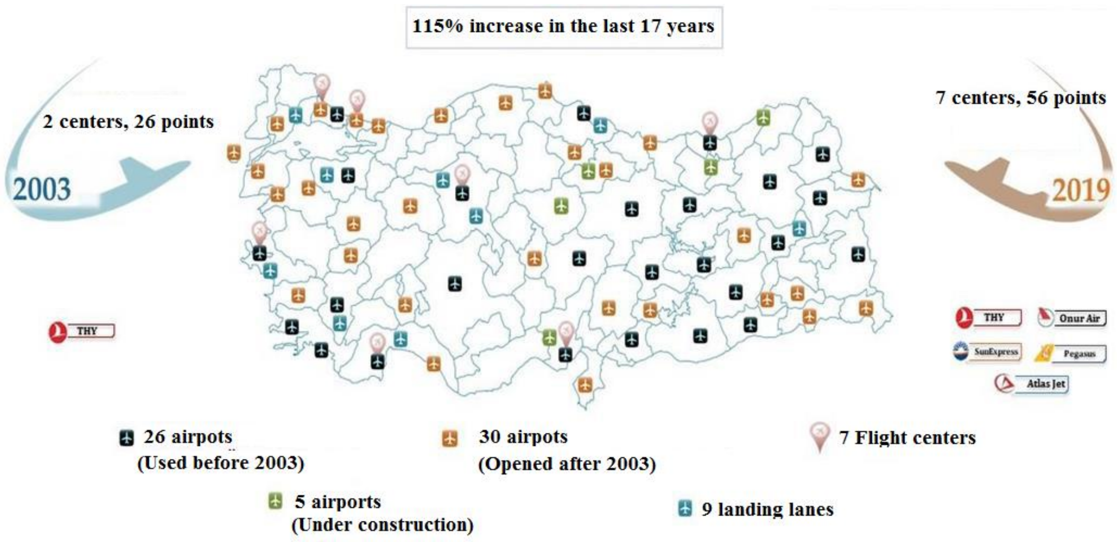


Figure 5. Domestic Growth Data in Turkey (DHMİ, 2020 a)

In international flights, while it was possible to fly to 60 destinations with only 2 airlines in 2003, the total flight points in 2018 were 318 destinations. As of 2019, flights are made to 328 destinations in 126 countries (Figure 6).

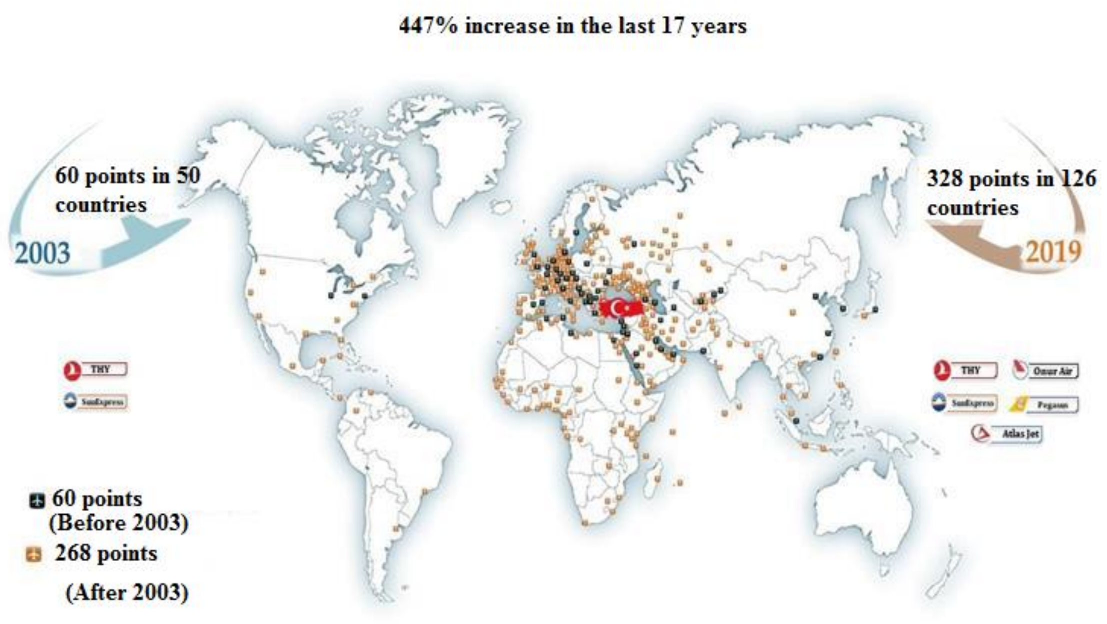


Figure 6. International Growth Data in Turkey (DHMİ 2020a)

According to the IATA 2019 Annual Report (IATA, 2019b), world air transport activities have entered into a faster development after 2017. In 2018, a 7.4%

increase in RPK was achieved in airline companies compared to 2017. In 2019, there was a 4.2% increase in RPK compared to 2018 (IATA, 2019b).

According to EUROCONTROL (2020) data, in this period, only 0.9% increase was experienced in European air traffic due to the bankruptcy of the British Thomas Cook Airline Company in 2019 and the strikes in France.

In cargo transportation, the situation is slightly different and although the cargo transportation, which stagnated between 2010 and 2012, has entered a steady increase after 2013, there was a 3.3% decrease in FTK in 2019 compared to 2018 (IATA, 2020).

When we look at the development in Europe, in the context of EUROCONTROL (2020) data, the total number of overflight flights in 2019 increased by 0.9% compared to 2018, reaching 11.1 million flights (Figure 7).

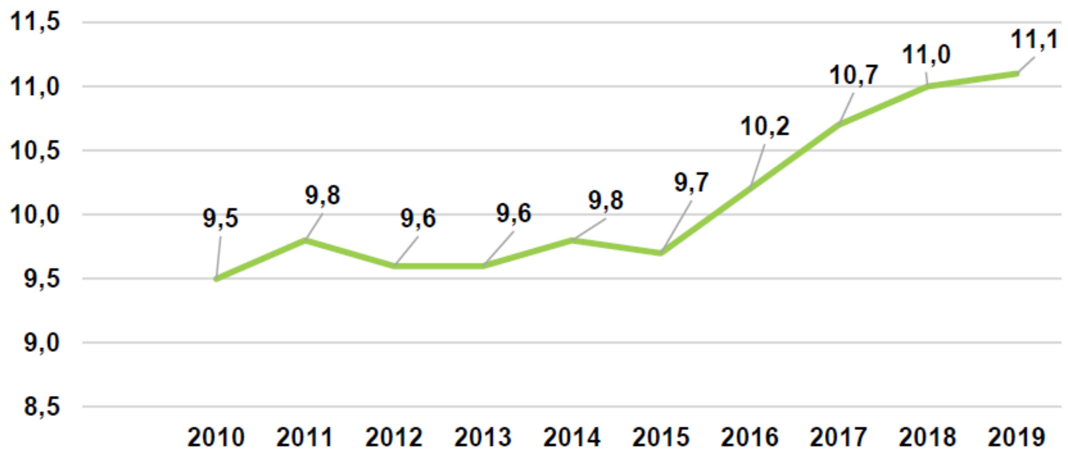


Figure 7. EUROCONTROL European IFR Traffic in 2010-2019 (EUROCONTROL, 2020)

In the last decade (2010-2019), the flight traffic, including overflight, has increased by 1.68 times, the number of passengers carried 2.02 times and the amount of cargo carried 2.81 times.

Looking at Figure 8, the total passenger traffic (including direct transit passengers) of domestic and international flights, which was 181,437,004 in 2015, decreased to 174,153,146 in 2016 with a 4% decrease. In 2017, with the elimination of political and economic negativities, passenger traffic was 193,576,844 with an increase of 11.1%, and 210,947,639 in 2018 with an increase of 9% compared to 2017.

In 2019, the total passenger traffic (including direct transit passengers) on domestic and international lines was 208,911,338 passengers with a 1% decrease compared to 2018 (DHMİ, 2020 a).

Domestic passenger traffic 102,499,358 passengers in 2016, 109,511,390 in 2017 and 112,911,108 passengers in 2018, international passenger traffic was 71,244,179 in 2016, 83,533,953 in 2017 and 97,587,056 in 2018. In 2019, domestic traffic decreased by 11.5% to 99,946,572 and international traffic by 11.1% to 108,427,124 passengers. In this way, the total passenger traffic in 2019 was 208,911,338 passengers, including direct transit (537,642) (Figure 5) (DHMİ, 2020 a).

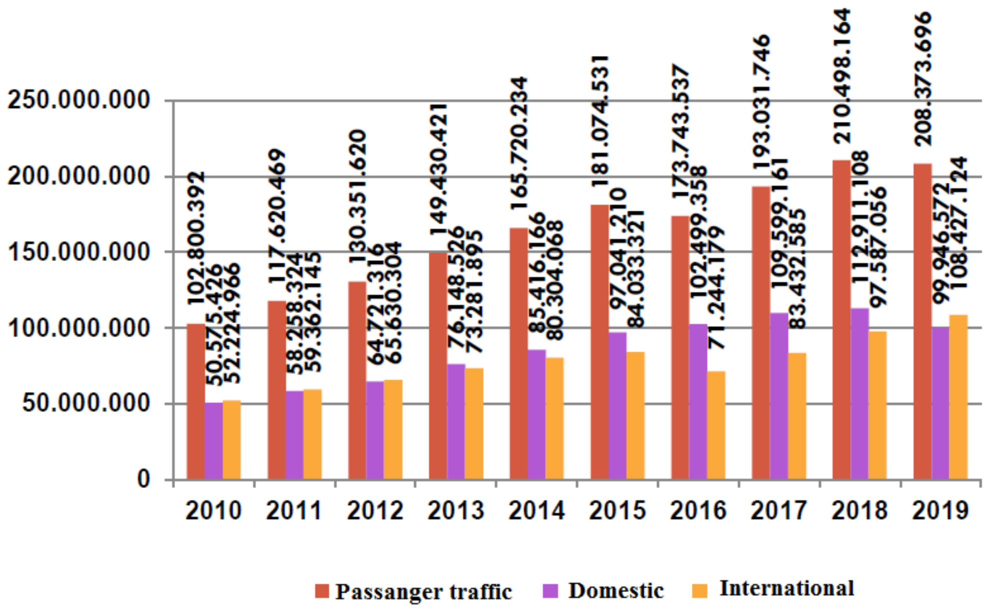


Figure 8. Total Passenger Traffic between Domestic and International Lines in 2010-2019 (DHMİ, 2020 a)

A significant portion of domestic passenger traffic in 2019 was Istanbul Sabiha Gökçen (22%), Istanbul (13%), Ankara Esenboğa (11%), Izmir Adnan Menderes (9%), Antalya (7%), Istanbul Atatürk (4%) and Adana (4%) Airports (Figure 9).

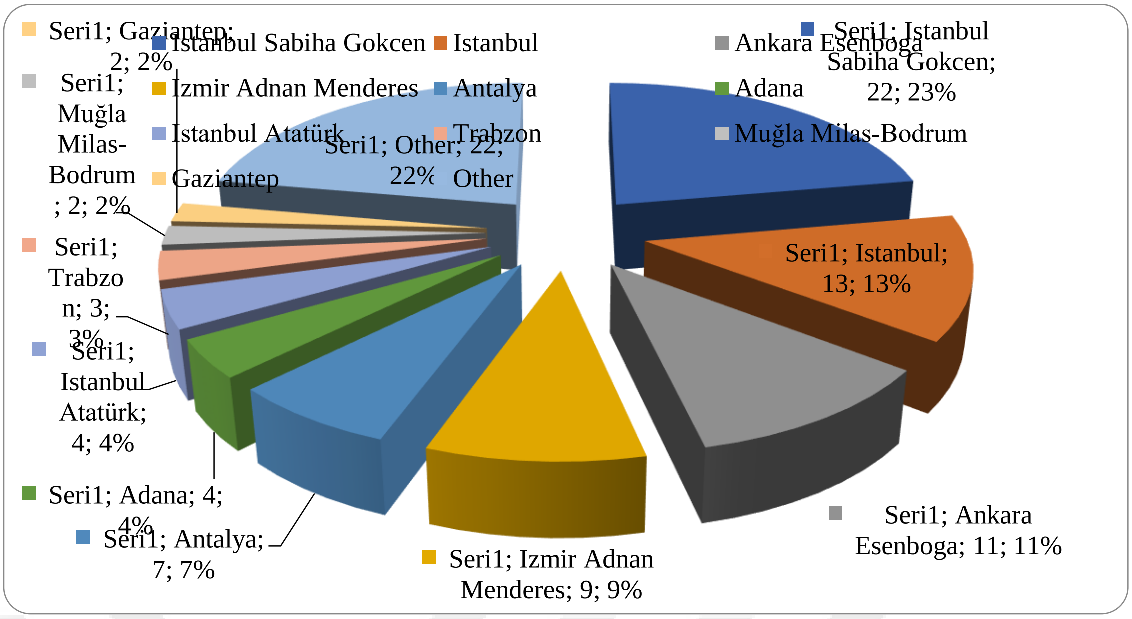


Figure 9. Domestic Passenger Shares of Airports in 2019 (DHMİ, 2020 a)

In 2019, the highest total international passenger traffic was Istanbul (36%), Antalya (26%), Istanbul Sabiha Gökçen (13%), Istanbul Atatürk (11%), Muğla Dalaman (3%), Izmir Adnan Menderes (%) 3), Esenboğa (2%) and Milas-Bodrum (2%) Airports (Figure 10).

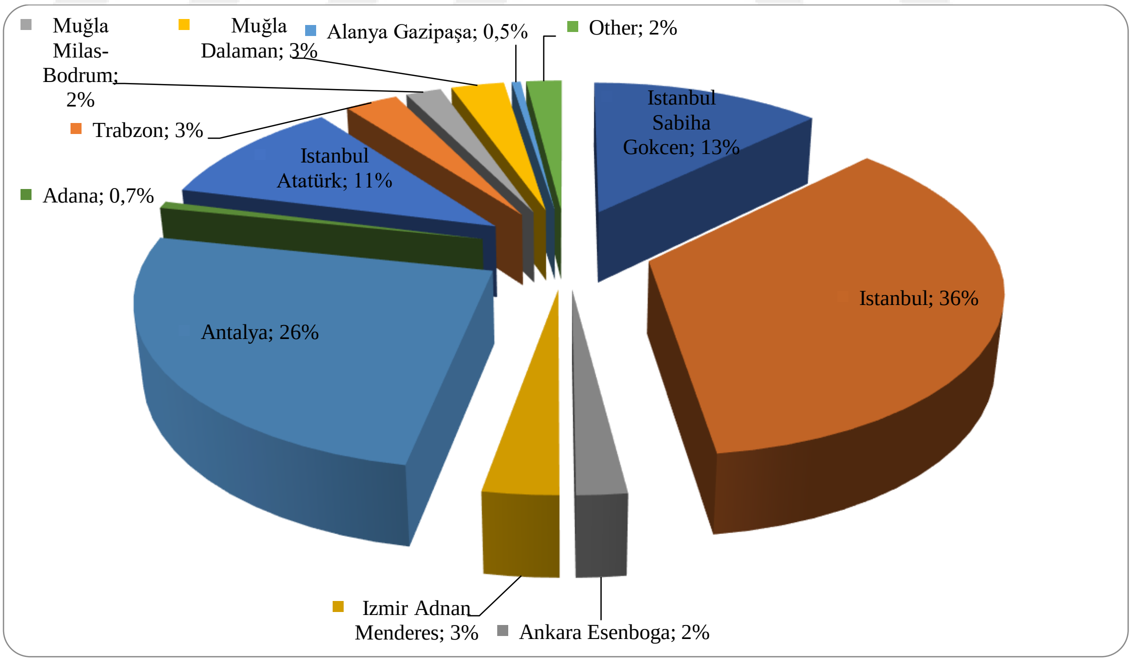


Figure 10. International Passenger Shares of Airports in 2019 (DHMİ, 2020 a)

In 2018, a total of 97,587,056 international passenger traffic was realized, 79,508,661 scheduled and 18,078,395 non-scheduled. In 2019, a total of 108,427,124 scheduled and unscheduled international passenger traffic was realized, including 85,315,082 scheduled and 23,112,042 non-scheduled (Figure 11).

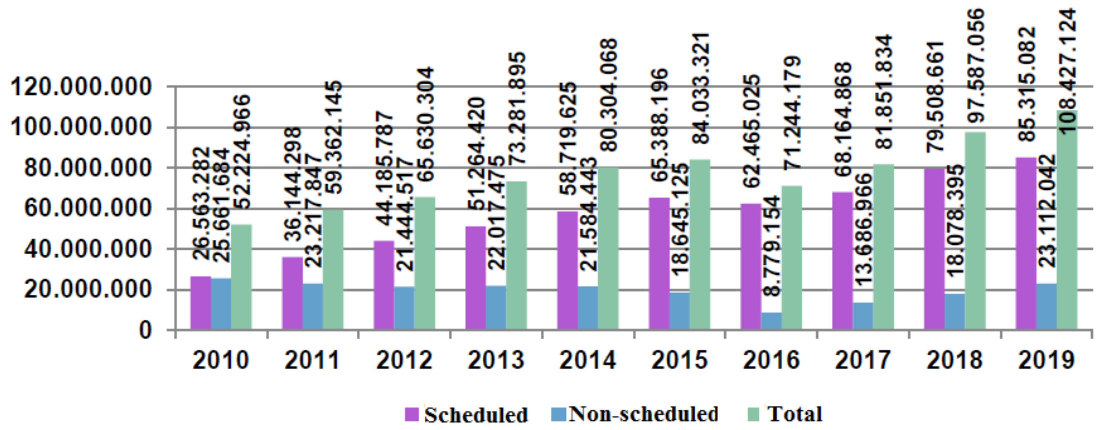


Figure 11. Airport International Scheduled-Unscheduled Passenger Traffic in 2019 (DHMİ, 2020 a)

In the domestic passenger market in 2019, Turkish Airlines (along with Anadolu Jet) had a 61% market share. Pegasus had 31%, Sun Express 5%, AtlasGlobal 1% and OnurAir 1% (Figure 12).

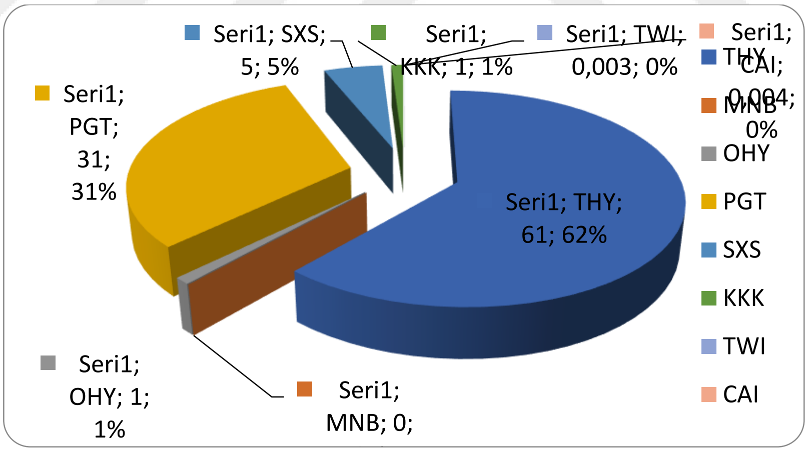


Figure 12. Airline Companies' Passenger Shares in Domestic Passenger Transportation (DHMİ, 2020 a)
(THY; Turkish Airlines, KKK; AtlasGlobal, CAI; Corendon, FHY; Freebird (Hürkuş), MNB; MNG, OHY; Onur, PGT; Pegasus, SXS; Sun Express, TWI; Tailwind)

Turkish Airlines alone took 61% of the international passenger market in 2019. Pegasus 19%, Sun Express 8%, AtlasGlobal 3%, Corendon 3%, Onur Air 3%, Freebird (Hürkuş) 1% and Tailwind 1% (Figure 13).

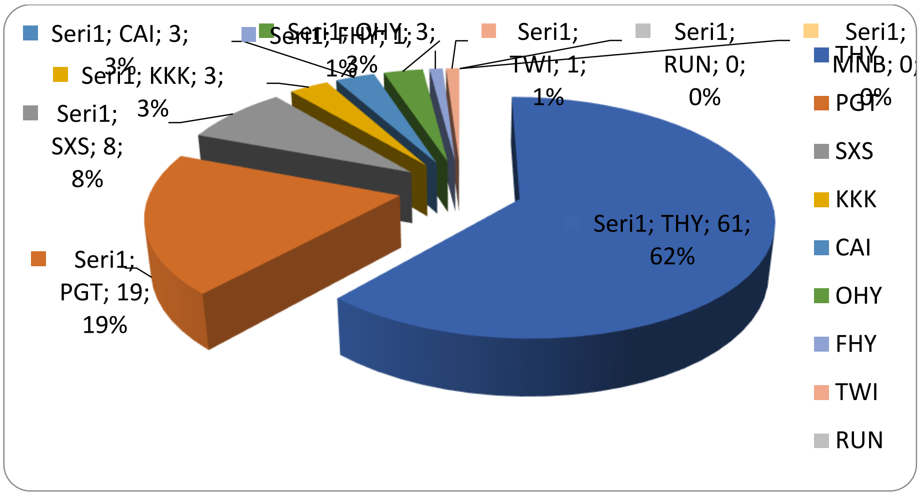


Figure 13. Airline Companies' Passenger Shares in International Passenger Transportation (DHMİ, 2020 a)

(THY; Turkish Airlines, KKK; AtlasGlobal, CAI; Corendon, FHY; Freebird (Hürkuş), MNB; MNG, OHY; Onur, PGT; Pegasus, RUN; ACT, SXS; Sun Express, TWI; Tailwind)

Lufthansa, another airline company that is the subject of our study, is the 2nd largest airline company in Europe and the 9th largest airline company in the world and is the national airline company of Germany. It serves approximately 410 destinations around the world and its fleet is located at Frankfurt Airport (Lufthansa Group, 2020).

Deutsche Lufthansa AG suffered a loss of €381 million in the first quarter of 2010 and €13 million in 2011, due to the economic recession and restructuring costs. It subsequently reduced approximately 20 percent of its 3,500 administrative staff and a total of 16,800 offices (Webb, Alex (May 3, 2012). In 2012, Lufthansa started to restructure its business processes within the scope of the SCORE system in order to increase its operating profit. As part of its restructuring plan, the company has transferred all short-haul flights outside of its headquarters in Frankfurt, Munich and Düsseldorf to the company's rebranded low-cost carrier Germanwings (Lufthansagroup.com, 2013).

The Table 8 is shown traffic data and financial results from 2013 to 2019.

Table 8. Traffic and Financial Data of Lufthansa German Airlines (Lufthansagroup.com, 2013).

	2013	2014	2015	2016	2017	2018	2019
Turnover and Result							
Revenue €m	17,302	17,098	17,944	15,409	16,441	15,917	16,119
Adjusted EBITDA €m	1,409	1,238	1,845	2,700	3,082	2,750	2,336
Adjusted EBIT €m	265	399	970	1,135	1,627	1,753	1,225
EBIT €m	n.d.	393	904	1,723	2,067	1,773	1,167
Traffic Data							
Passengers (thousands)	76,261	77,547	79,305	62,418	70,108	70,108	71,307
Employees	39,847	40,199	40,262	34,654	34,754	34,754	35,221
Aircrafts	396	400	414	350	357	351	364
Route Network	218	235	258	203	205	209	214
RPK (million)	153,334	156,826	162,173	145,878	152,750	160,074	168,085
ASK (million)	193,807	197,478	202,314	184,428	187,762	196,769	204,202

Data on the number of passengers of Lufthansa airlines between 2008 and 2019 can be seen in Figure 14. Accordingly, the company, which had 70.5 million passengers in 2008, reached 145.2 million as of the end of 2019. Lufthansa Cargo achieved a turnover of 2.5 billion Euros in 2019. (https://lufthansa-cargo.com/meta/meta/company/about-us).

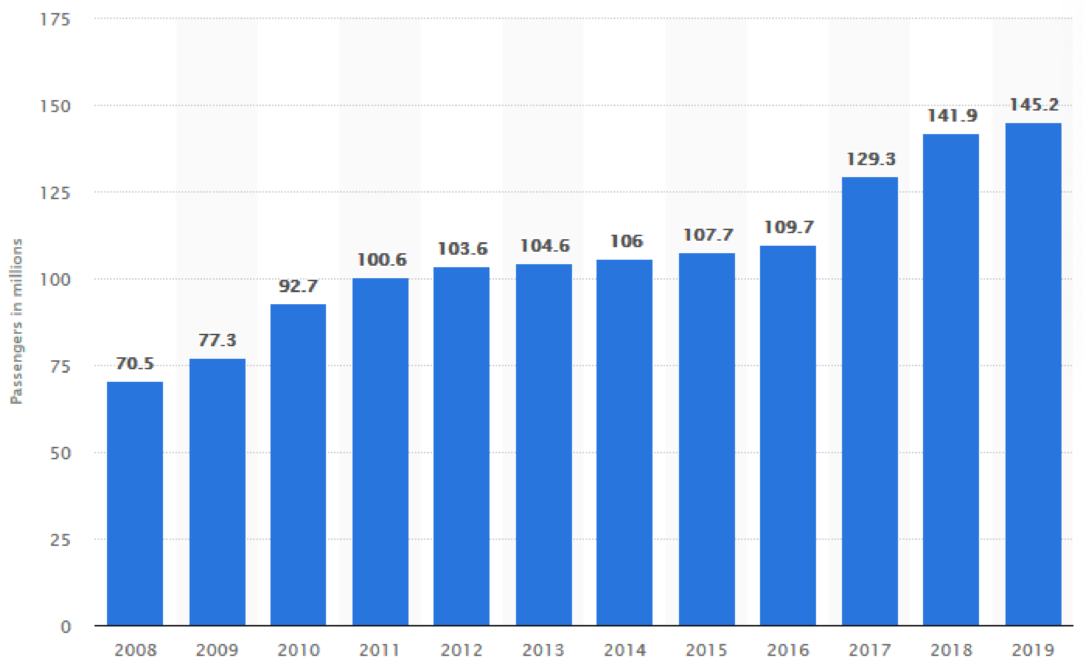


Figure 14. Number of Passengers of Lufthansa Airlines in the Period 2008-2019 (STATISTA, 2022).

Table 9. Key Business and Operating Results of Lufthansa Group

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Turnover (€ m)	22,283	27,324	28,734	30,135	30,027	30,011	32,056	31,660	35,579	35,542	36,424
Net profit/loss (€ m)	-43	1,131	-13	990	313	55	1,698	1,776	2,364	2,163	1,213
Number of employees (k at year end)	117,5	117,0	116,4	117,0	118,3	118,8	120,7	124,3	129,4	135,5	138,4
Number of passengers (m)	77,3	91,2	100,5	103,1	104,6	106,0	107,7	109,7	130,0	141,9	145,1
Passenger load factor (%)	77,9	79,3	77,6	78,8	79,8	80,1	80,4	79,1	80,9	81,5	82,5
Cargo load factor (%)	60,6	68,0	66,8	66,9	69,1	69,9	66,3	66,6	69,3	66,6	61,4
Number of aircraft (at year end)	722	710	636	627	622	615	602	617	728	763	763

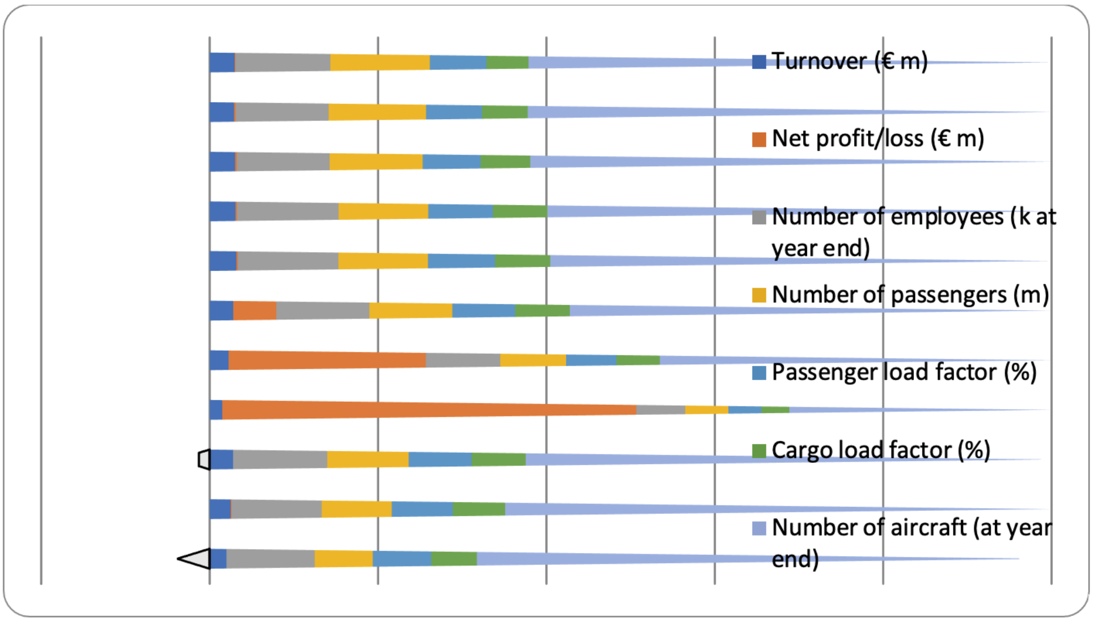


Figure 15. Key Business and Operating Results of Lufthansa Group

Alitalia Societa Aerea Italiana S.p.A., known as Alitalia, is the Italian national carrier. Since its launch in 1947, Alitalia has faced multiple crises (Di Marco, 2018). Until 1996, the airline had a monopoly position in the Italian market, but from 1997 it began to face financial problems due to the lack of a business plan. In addition, increased competition due to European rules on liberalization of the airline market put pressure on Alitalia. The number of passengers of Alitalia Airline Company between 2013 and 2018 can be seen in Figure 16. As can be seen from the graph, there is not a big change in the number of passengers between the years. Alitalia also carried over 71,000 tons of cargo in 2018.

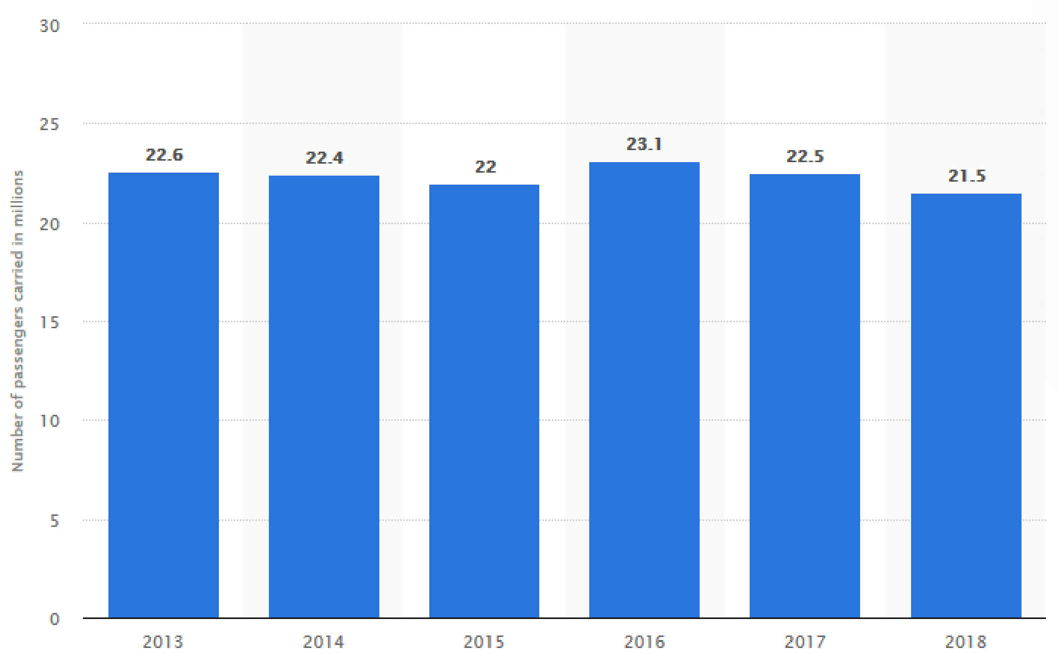


Figure 16. Number of passengers of Alitalia airlines in the period 2013-2018 (STATISTA, 2022)

Table 10. Key Business and Operating Results of Alitalia

	2015	2016	2017	2018
Turnover (€ m)	3,312	2,880	2,915	3,071
Net profit/loss (EBIT) (€ m)	-199	-360	-496	-343
Number of employees (FTE)(at year end)	×	×	10,871	10,711
Number of passengers (m)	22.1	22.6	21.3	21.8
Passenger load factor (%)	76.2	78.7	78.7	80.0
Number of aircraft (group)(at year end)	141	×	121	×

2.17. Economic Development and Measuring

The concept of economic development has begun to come to the fore with the underdevelopment phenomenon gaining importance in the economics literature. The underdevelopment rate in the world is one sixth of the general population. Economic development, which faces the problem of underdevelopment, is not only about increasing production and per capita national income, but also changing and renewing the economic and socio-cultural structure in an underdeveloped society (Özsoy, 2012a, p. 3).

2.17.1. Definition of economic development. In addition to the increase in production and per capita income, the concept of economic development refers to structural changes, technical and institutional arrangements, changes in production structure and resource allocation between sectors. Although economic development includes economic growth, it is not only the quantitative growth of the existing, but also the establishment of a new structure in a positive sense (Özsoy, 2012a, p. 3).

According to the Classical Economics Doctrine, economic development is a natural and spontaneous process in economic growth. However, economic development is not only economic growth (national income increase), but also social, political, cultural, etc. It is a general dimensional structural transformation including areas (İlkin, 1983, p. 59). In a broad sense, economic development is a process that increases people's living standards, self-confidence and freedom and improves the quality of all people's lives and abilities (Todaro and Smith, 2011, p.5).

In economics literature, economic growth and economic development are close concepts. However, economic development is a more comprehensive concept than economic growth. While economic growth is a numerical (quantitative) value, economic development is a qualitative (quality) value. In order to ensure economic development, economic growth must occur and continue for a long time (Tokatlıoğlu, 2012). Economic development is an increase in social welfare together with social and political development as well as economic growth (Pınar, 2012, p. 159).

If we touch on the historical process of economic development; It was handled by Adam Smith and David Ricardo, but II. It lived its golden age after World War II. It was only from the mid-1950s that economic development was associated with underdeveloped countries and people living there. It was thought that economic development economy, which experienced its brightest years in this period, would be realized with rapid capital accumulation. Rapid capital accumulation will realize rapid industrialization and eliminate unemployment in rapid industrialization. The aim of economic development is to transform the traditional stable subsistence economy into an economy that can stand on its own feet and is similar to its examples in the West (Kaynak, 2003, p. 18).

Increasing national income and measuring it as per capita income are not sufficient conditions to eliminate poverty in that country in order to achieve economic development. As observed in many countries, households belonging to the lowest income group may not benefit from economic growth and even the number of households in absolute poverty may increase. In this context, it is possible to say that the World Bank attaches the necessary importance to income distribution as well as economic growth and that the International Labor Organization attaches importance to basic human needs. The definition of economic development, which attaches more importance to poverty and inequality, can be expressed as the development of economic, social and institutional structure as well as the increase in per capita income (Yıldırım et al., 2008, p. 465).

The subject of economic development is less developed countries and developing countries. Previously, the term backward economy or backward economy was used for these countries. As a matter of courtesy, the expression underdeveloped country has been used instead of such expressions. Since the concept of less developed country is quite long in English (less developed country), the term developing country has started to be used. On the other hand, the expression of an underdeveloped country is quite static and lacks the meanings related to the change and dynamism of the concept of economic development. The concept of developing country is quite broad. All developing countries can be expressed with this concept (Özsoy, 2012a, p. 4).

Insufficient capital accumulation is one of the major economic development problems of underdeveloped countries, which form the basis of economic development. The insufficient capital accumulation and its slow increase are explained by the "Vicious Cycle of Underdevelopment" model (Han, 1988, p. 8). Basic economic characteristics of less developed countries; It is possible to list as low per capita income, high share of the agricultural sector in total production, a foreign-dependent trade structure, insufficiency of infrastructure investments, and the fact that income distribution is far from fair share (Öztürk, 2012, p. 503-504).

2.17.2. Economic Development Models.

2.17.2.1. Classics, Keynes and Harrod-Domar's views and development theories. If we look at the development of economic development theories in the historical process, Classics, J.M. Keynes and Harrod-Domar models come to the fore. Adam Smith, the founder of Classical Economics, expressed the idea of liberal economy in his work named "The Wealth of Nations". According to Smith, division of labor ensures specialization, specialization efficiency, productivity investments, economic development in investments. Adam Smith emphasized productivity in his economic development theory. According to him, increasing demand causes specialization, and specialization causes economies to grow and become more efficient (Dülgeroğlu, 2000, p. 32).

J.M. Although Keynes does not have a direct theory of economic growth and economic development, Keynes proposed a theoretical state intervention in his work titled "The General Theory of Employment, Interest, and Money" written in 1936 during the 1929 economic crisis, and this proposal solved the problem. In this analysis, Keynes did not suggest any different solution for less developed countries. However, Keynes's determination of the necessity of a state intervention provided a legitimate basis in terms of economics to the concept of "intervention" that economic development economics took from the modernization theory (Tüylüoğlu andÇeştepe, 2008, p. 42-43).

The models developed separately by Harrod (1939- “An Essay in Dynamic Theory”) and Domar (1946- “Capital Expansion, Rate of Growth, and Employment”) were named as the Harrod-Domar model due to their similar analyzes. It is possible to achieve full employment or emerge an economy without inflation, but it is a knife-edge situation. It should be calculated how much a country should get rich, how much investment and savings should be made for this. In this model, the growth of an economy depends on the amount of investments, which in turn depends on the level of savings. The more economies can save from their incomes and turn them into investments, the more they can grow (Dolun and Atik, 2006, s. 8).

In addition to the historical process of economic development, the economic growth model explained by Solow (1956) in his work named “A Contribution to the Theory of Economic Growth” has an important place in terms of economic growth models. In the growth model created by Solow (1956), when examining the relationship between saving, capital accumulation and growth, first of all, the effects of capital on output are taken into account (Ünsal, 2013, s. 646). The Solow model will be explained in detail below.

Economic growth and development models can be divided into five as Solow growth model, Rostow's historical approach theory, dual structure model, balanced development models and unbalanced development models.

2.17.2.2. Solow growth model. Neo-Classical economic growth model developed by Solow (1956) has an important place in growth models. In Solow's economic growth model, the relationship between saving, capital accumulation and growth is analyzed and above all the effects of capital on output are taken into account. In Solow's growth model, when examining the relationship between saving, capital accumulation and growth, the effects of output on capital accumulation are also taken into account as well as the effects of capital on output. Hence, the starting point of the Solow model is that in a closed economy where there is no government, output is used for consumption and investment purposes. The relationship between the saving rate and growth has an important place in the Solow growth model. Saving level, steady state is one of the factors affecting the capital and output level in the model. In the Solow growth model, the increase in the savings rate temporarily positively affects the economic growth. In other words, the reason for economic growth in the Solow model is not the increase in the savings rate (Ünsal, 2013, p. 646-651).

2.17.2.3. Rostow's historical approach theory. In W. Rostow's model, economicdevelopments are handled with a historical approach. Especially in the take off phase, the economic development problem of underdeveloped countries was addressed and this model gained importance. Historical development approach handles the development of countries in five stages. These stages are: traditional society stage, take-off stage, take off stage, maturity stage, mass consumption stage (İlkin, 1983, pp.61-62).Rostow stated that societies fall into one of five categories in terms of their economic dimensions (Rostow, 1960, p. 4).

2.17.2.4. Traditional community phase. It is the period when the agricultural structure dominates the economy. A large part of the society is engaged in agriculture. It is a period when the production technique is very backward and the division of labor is limited. There is little market relationship. The decisions of economic units are short-term. Sovereignty in society is in the hands of large agricultural owners. Institutional infrastructure has not been created properly. As a natural consequence of all these conditions, the economy is settled in a low income balance and is in a stagnant structure. The amount of savings is very limited (Han & Kaya, 2008:33). The basic fact of the traditional society stage is that a ceiling is formed at the level of achievable output. This ceiling stems from the fact that the potentials that come from modern science and technology are either not available or not regularly and systematically applied (Rostow, 1960, p. 4).

2.17.2.5. Preparation for take-off phase. Rostow defines the take-off preparation phase as the phase between the traditional community phase and the take-off phase. At this stage, conditions will be prepared for the take-off phase. Looking at Western Europe, it is seen that this transition began in the late 17th-early 18th century, when modern science entered the production function of both agriculture and industry. One of the most important economic conditions of this stage is that at least 10% of the national income must be allocated to investments in order for economic growth to sustain itself. It is important that investments are made in fixed capital investments such as infrastructure. The existence of a new elite class is required. Produced products will be transferred from agriculture to industry by this class (Gönel, 2013, p. 59-60).

2.17.2.6. Take-off phase. The take-off phase is based on the first phase of industrialization. According to Rostow, a strong stimulus is often seen at the beginning of takeoff. These stimulants are political movements such as the German Revolution of 1848, the Meji Restaration in Japan in 1868 or the independence of India. However, the important issue here is not the form of the stimulus that initiated the development, but the positive and regular reaction of the society against it (Kaynak, 2011, p. 191).

According to Rostow, for the take-off phase; The share of productive investments in national income should increase to 5% or at least 10% or more. The emergence of one or more manufacturing industry branches that can play a leading role in economic development as a leading sector (The leading sector should make productive investments, apply new production techniques, create a second expansion by affecting other branches of activity with externalities). There must be a political, social and administrative environment that will encourage the development of the modern segment, make good use of the savings that will arise in foreign trade, and ensure the continuity of the initiated development (Özsoy, 2012b, p. 34).

2.17.2.7. Maturity stage. After the takeoff phase comes a long phase of fluctuating progress as the ever-increasing economy pushes modern technology to spread across the sphere of economic activity (Rostow, 1960, p. 9). It is a stage where each country differs according to its structure. Technology is generally applied in all segments of the economy. The country reaches the stage where it can manufacture all kinds of products. Export consists mostly of industrial products. Some problems may occur during the maturity stage. For example; It is the difficulty of using advanced technology in some parts of the country. As a result, developed and undeveloped sections or regions in the country are encountered. According to the dates determined, England reached this stage in 1850, Germany and France in 1910 (İlkin, 1983, p. 68).

2.17.2.8. Mass consumption age. After maturity, every nation reaches a high level of mass consumption. At this stage, society no longer accepts the development of modern technology as a goal. In time, major sectors are shifting towards the production of goods and services for consumption. Income per capita has increased so much that many have gained power that surpasses basic needs such as housing, food and clothing. In this period, welfare is at the forefront (Tüylüoğlu & Çeştepe, 2008, p. 66).

Rostow's theory of historical approach has been criticized from various angles. These criticisms; It is very difficult to determine the durations and transition points of the stages, the features listed in each stage can be prominent in the previous and next stages, the emergence of the generalization that Rostow makes generalization with very limited observations that the units will not be valid for the developing countries at the same stage, Separating flour can be listed as not always a situation that can be provided (Dülgeroğlu, 2000, p. 47).

2.17.2.9. Dual structure theory. Dual structure theory, also known as economic dualism, explains a large part of the underdevelopment phenomenon. The concept of duality; Structurally, different economic segments (sometimes regions) are found side by side within an economy. These segments are not only structured and developed to varying degrees, but they are also organized, organized and more or less isolated from each other in principle. According to the theory, one of the economic and social structures of the underdeveloped country has developed, while the other has not (Han and Kaya, 2008, p. 41).

Binary structure theory; There are three categories: economic dualism, regional duality, and social duality. Economic dualism is the duality in underdeveloped countries and is another name for dual structure theory. Regional dualism is the coexistence of developed and undeveloped regions in the underdeveloped country.

Social duality; It is a concept used by Boeke and other Dutch economists in studies of Indonesian society under Dutch colonization. According to these studies, an economic and social system that contradicts the traditional society was imported into Indonesia from outside. Generally, this system can be either capitalism or socialism. As a result, cultures and societies operating according to different provinces with their beliefs, social and psychological value judgments, organization style and production technology started to live together in society. As a result, a social duality occurred (Özsoy, 2012b, p. 42).

2.17.3. Economic development strategies

2.17.3.1. Balanced development strategy. The balanced development strategy is explained by F.List. F. List emphasized the importance of a balanced development within the agricultural sector, manufacturing sector and trade sectors and showed the relations between consumption and production. In 1928 Young focused on this issue. It has expanded as a result of being taken up by authors such as Rosenstein-Rodan, Nurkse, T. Scitovsky, and A. Lewis (İlkin, 1983, p. 80).

The concept of balanced development refers to the simultaneous and harmonious growth and development of all sectors in the economy. Balanced development means continuing full employment and increasing aggregate demand at a rate equal to the increase in aggregate supply. The precondition for balanced development; For all sectors of the economy to grow together, investments must be planned and distributed in a balanced manner. Studies conducted by Nurkse and Rosenstein-Rodan on this issue have come to the fore among balanced development models (Dülgeroğlu, 2000, p. 41).

Rosenstein-Rodan is the economist who introduced the "Great Push Approach" to the economic development literature. His article "Industrialization Problems of Eastern and Southeastern Europe" published in 1943 is considered a pioneer in the field of economic development (Gönel, 2013, p. 56). Rosentein-Rodan stated that the market cannot be relied upon for optimal distribution of investments. Balanced growth can be achieved with investments that fit together. Making these investments will play a role in increasing income and demand. Otherwise (if compatible investments cannot be made), demand and therefore income will not increase (Akdemir, 2015).

Nurkse's "Vicious Cycle Approach" states that, based on the fact that income per capita is extremely low in underdeveloped countries, savings are insufficient when the income level is low, the necessary investments cannot be made due to insufficient savings, thus productivity and income level will remain low again. The low capital accumulation in these countries, together with the extremely low level of education, causes a decrease in welfare and productivity. Nurkse is in favor of balanced growth, just like Rosenstein-Rodan, that more than one sector is developed simultaneously, and that they create external effects on each other. As a result of the sectors producing consumption goods, the growth of the domestic market will both provide capital accumulation and increase investments (Gönel, 2013, p. 57-58).

According to Nurkse, it is necessary to invest in different industries simultaneously in order to get rid of the "Vicious Circle Approach". As the market will expand completely as a result of investment in different industries, it will be possible to get rid of the vicious circle. Nurkse stated that planning is of great importance for the development of the underdeveloped economy (Adaçay, 2012:59).

2.17.3.2. Unbalanced development strategy. Hirschman has come to the fore with his work on unbalanced development. Hirschman. He believes that economic development can be mobilized by “unbalanced growth” against the “balanced growth” of economists such as Rosenstein-Rodan and Nurkse. It refers to the importance of external cash benefits such as unbalanced growth and balanced growth; It indicates the necessity of the "big push", it can be compatible with economic planning. However, Hirschman's unbalanced growth aims to create constraints in order to mobilize economic decision centers. The pressure of constraints will stimulate decision centers to mobilize, and will be an impulse to increase the amount of production resources (Kazgan, 2012, p. 281-282).

Hirschman argued that in order for underdeveloped countries to enter the process of economic growth, investments should be sequenced and planned not to create a balance between sectors, but to create an imbalance. Based on Scitovski, he stated that in an economy where free competition exists, profits are a rough indicator of imbalance. The existence of profits in an industry attracts investments to that industry. Profits begin to disappear as investments increase. Thus, the investments are directed towards the balance. In a balanced environment, there is no incentive for investments in this sector (Tüylüoğlu and Çeştepe, 2008, p. 70-71).

Streenten is another theorist in the unbalanced development model. According to Streenten, while balance is a situation that maintains the status quo, development is a change in the status quo. Streenten stated that imbalance is not an obstacle to growth, but a stimulating factor. According to Streenten, insisting on balance can cause bottlenecks rather than prevent recession in the economy (Adaçay, 2012, p. 63). The development poles model is another unbalanced development strategy. This is an unbalanced development process that occurs as a result of a functional integration due to the activities of a certain number of economic units (İlkin, 1983, p. 105).

2.18. Measuring Economic Development

In addition to economic growth, economic development depends on factors such as the number of doctors per capita, child mortality rate, income per capita, education rate, number of teachers, and other factors such as improving environmental conditions (Korkmaz, 2013, p. 15). Economic development criteria are important in terms of showing the development level of the countries. Generally, Gross National Product(GNP) and GNP per capita, Purchasing Power Parity, and Human Development Index are used to measure economic development (Özsoy, 2012a, p. 6).

2.18.1. Gross national product and gross national productper capita. The (GNP) value is used to compare the development levels of countries. Besides, it can be used in GNP per capita instead of GNP (Özsoy, 2012a, p. 6). However, using GNP per capita in country comparison has various drawbacks. In the first place, it does not give information about GNP per capita income distribution. In addition, it does not make any statement about the improvement of the quality of life and does not take into account the development potential of countries. In addition, there are practical benefits of using GNP per capita in terms of giving an idea of where countries are in development (Kaynak, 2011, p. 86).

GNP per capita is generally used to measure underdevelopment. Because, in countries with high income levels, positive developments have been made that affect human welfare in social and political terms. In countries with low income, social underdevelopment, low level of welfare and political personal freedom are observed to be in the background (Pınar, 2012, p. 160).

2.18.2. Purchasing power parity (PPP). The GNP value is calculated in the country's own currency. While the GNP value is used in international comparisons, it is generally converted to US dollars. However, real exchange rate for two countries with different development levels is not a good indicator of purchasing power for these countries. The reason for this is that when calculating the exchange rate, goods and services subject to foreign trade are taken into account. The excess of cheap, labor-intensive, non-standardized goods and services in developing countries causes a low GNP. SGP, on the other hand, is an important criterion in that it is based on both goods and services subject to foreign trade and non-tradable goods and services (Özsoy, 2012a, p. 8)

Purchasing power parity indicates the purchasing power of countries. It is the ratio of national currency amounts required to purchase a certain basket of goods and services in various countries. PPP eliminates the price discrepancy between countries, enabling the comparison of GDP with the actual volume and making the intercountry development level comparisons more reliable (Kaynak, 2011, p. 74-75).

2.18.3. Human development index. Measuring economic development is the standard in measuring the amount of goods and services produced and income in any economy, gross domestic product, gross national product or national income and per capita calculations obtained by dividing them by the total population. These measurement tools are universally accepted tools. The problem of economic development can be better understood when calculating how countries share the world's income with the help of these tools (Gönel, 2013: 15). In order to measure human development as well as economic development; Income level, education and healthy living elements are added. This index calculated by the United Nations is the Human Development Index. "Human Development Index, long-term progress in three basic dimensions of human development is" a long and healthy life "," access to information "and" a good standard of living "within the context of an index that measures by addressing" (UNDP Turkey Office, 2015).

The Human Development Index (HDI) deals with the income, education and health domains of socio-economic life. A healthy and long life, obtaining information and access to resources for a good standard of living are important indicators of human development (Günsoy, 2005, p. 38). The Human Development Report, first published in 1990, introduced the Human Development Index in order to evaluate human development in a fundamental dimension (Human Development Report, 2016, p. 25). The report defines human development as both the process of expanding people's choices and improving the level of welfare they attain (Srinivasan, 1999, p. 309). The Human Development Index calculated by the United Nations Development Program is important in terms of showing the way countries traveled in their economic development processes. The Human Development Index, which has been calculated every year since 1990 and continuously improved, is calculated with the average longevity index, education index and income index as of 2010. Then, the Human Development Index is calculated by taking the geometric mean of these three indices (Kaynak, 2011, p. 88).

The index developed by the United Nations Economic Development Program is an indicator of the quality of life. Values in this index are income converted into purchasing power, average life expectancy, average years of education and literacy rate among adults (Han and Kaya, 2008, p. 275).

The index is calculated as follows: among all countries for which data are collected for income, life expectancy and education index, there are the lowest and highest values. The difference between these two values is considered to be the total length to be reached. A country's score shows where (in percentage) of the total length. Economic development index is reached by dividing the sum of per capita income index, life expectancy index and education index into three (Han and Kaya, 2008, p. 275). As an exceptional case, the logarithm of the income is taken to reflect the gradually decreasing importance of the income increase in the index. United Nations data to calculate the index value, the International Monetary Fund, is taken from international organizations such as the World Bank (UNDP Turkey Office, 2015).

The Human Development Index (HDI) takes values between 0.00 and 1.00 and the country classification is made according to the quarters of the index (Kaynak, 2011: 88). If the country's HDI value is in the highest level 70-100, if it is in the "Very High Human Development" group, if it is in the 70-80 quarter, it is in the "High Human Development" group, if it is in the 55-70 quarter, it is in the "Medium Level Human Development" group and the lowest is 00 If it is in the -55 quarter, it is included in the "Low Level Human Development" group (Human Development Report, 2016, p. 22-25).

Education, life expectancy and income indices, which are variables of the Human Development Index, may not show the economic development in a country in detail. For example, where there is unfair distribution of income, per capita income may not reflect the reality or there may be differences in literacy rates between men and women (Tüylüoğlu and Karalı, 2006, p. 59). Therefore, in the United Nations Development Program Human Development Report; Inequality-adjusted HDI, Gender Based HDI, Gender Inequality Index, Multidimensional Poverty Index is published (UNDP Turkey Office, 2015).

2.18.4. Elements of the human development index. In this section, the elements of the Human Development Index are explained.

2.18.4.1. Healthindex. Health level is an important development indicator and is one of the sub-indexes of HDI. Based on life expectancy, education and per capita income, the index aims to broaden the scope of development analysis. In this context, there is a mutual relationship between the health level of the society and economic development. The right to a healthy life can be examined from two perspectives as factors and variables affecting the health level of individuals and communities (Günsoy, 2005, p. 36-41).

Health level; life expectancy at birth, infant mortality rate, under-five mortality rate and maternal mortality rate. Factors such as the health level of the society, literacy, access to health services, access to drinking water and sewage, and climatic conditions affect (Günsoy, 2005, p. 40-41).

2.18.4.2. Education index. In order for countries to realize social economic development, they should give special importance to education. Economic development is not just economic growth; Considering that besides economic growth, there are structural and intellectual changes in various fields that are as important as it is, it is the place where the emphasis is on both general education and vocational education (Han and Kaya, 2008, p. 114).

Education index, which is one of the indicators of human development, is based on the assumption that the average education period of individuals aged 25 and over and the rates of school enrollment of children at the age of starting school remain the same within the life time of the school-age child. It is the arithmetic mean of the results obtained (Fırat and Aydın, 2015, p. 81-82).

2.18.4.3. Income index. Income level is the power of control over the resources that are necessary for a desirable life in economic development and which are extremely difficult to measure. However, considering the deteriorations caused by non-tradable goods and services, fluctuations in exchange rates, tariffs and taxes; Data on income per capita at nominal prices are not useful for international comparisons. Therefore, such data were developed using GDP per capita indicators according to Purchasing Power Parity, which show a better estimate of purchasing power for goods and control over resources for a desirable standard of living (Tüylüoğlu and Karalı, 2006, p. 58-59). It is possible to summarize the indicators of development in Figure 17.

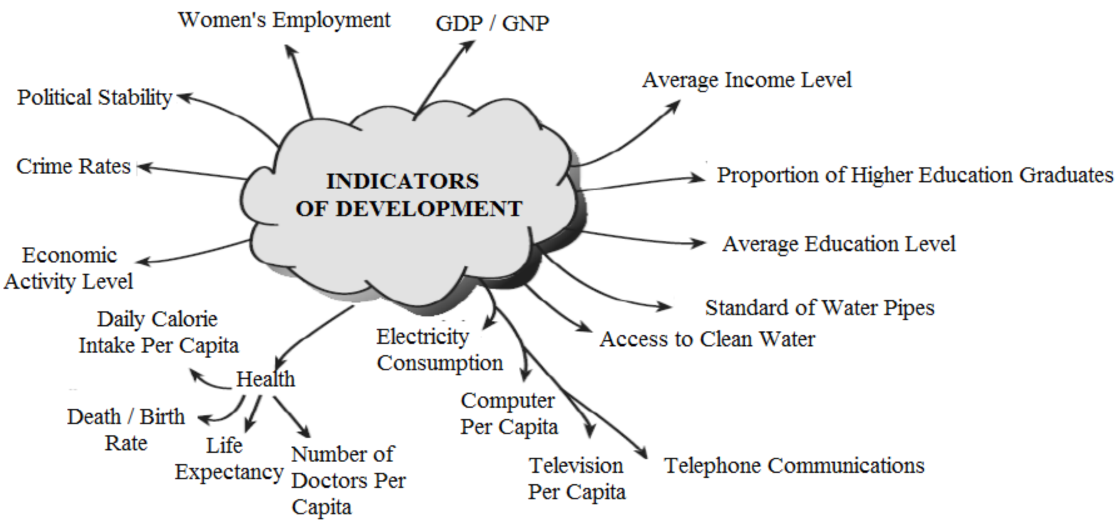


Figure 17. Indicators of Development (Özsoy, 2012a, p.21)

2.19. The Relationship Between Air Transportation and Economic Development

Considering the cycle of economic activities, it is seen that there is an interaction between air transportation and economic development. In the literature, it is seen that there are studies on the relationship between air transport demand and economic development (Abate, 2016; Aguirre et al., 2018; Njoya and Nikitas, 2020). Interactions between air transport demand and economic development may indicate correlations and/or causal relationships. There are still studies on the effects of developments in air transport on economic development or whether economic development has an effect on air transport demand and findings may differ from each other (Baker et al., 2015; Hakim and Merkert, 2016; Van de Vijver et al., 2016; Chang and Chang, 2009; Mukkala et al. Tervo, 2013).

Chapter 3

Method

3.1. Research Question

The research question was determined as follows in line with the above mentioned purpose in the context of macro-institutional theory, what are the variables that affect the financial performance of passenger transport companies operating in the airline sector and what is their effect?

The study's primary purpose is to reveal the variables that affect the financial performance of passenger transport companies operating in the airline sector. Purpose of this analysis is to examine the long and short-term relationships of the effects of the countries' economic development on the performances of their airline companies. Therefore, as a developed country Germany's Lufthansa Airlines and as a developing country Türkiye's Turkish Airlines are discussed in this analysis. Additionally, Italy's Alitalia Airlines has been included in the analysis as a control unit.

At the same time, with the inclusion of the airline company belonging to Italy, a developed country and declared bankruptcy, in the study, the determinants of performances will be discussed from a different perspective, and it aims to contribute to the literature.

3.2. Literature Review

In the literature, it is seen that there are various studies on air transport and economic development. Green (2007) stated in his study that there is a strong relationship between air traffic and economic growth, but the direction of causality is unclear. Button et al. (1999) analyzed the relationship between airport traffic and employment with the Granger causality method and concluded that airport traffic significantly increased employment. Marazzo et al. (2010) examined the relationship between air passenger demand and economic growth (GDP) in Brazil and found cointegration. Fernandes and Pacheco (2010) evaluated the relationship between economic growth and domestic air passenger traffic using Brazil's data from 1966 to 2006. The results show a unidirectional Granger causal relationship from economic growth to domestic air transport demand. Button and Yuan (2013) evaluated the relationship between growth and employment in air transportation in their study in the United States. Van De Vijver et al. (2014) investigated the causality between trade and air passenger travel. Hu et al. (2015) evaluated the relationship between economic growth and domestic air passenger traffic as short and long term. In this study, studies evaluating the financial performance of enterprises operating in the aviation sector were examined.

Since the financial performance of aviation enterprises is also examined in terms of macroeconomics, this issue has also been taken into account in the literature section. The literature on the relationship between macroeconomic variables and financial performance is given in Table 11.

Table 11. Literature on The Relationship Between Macroeconomic Variables and Financial Performance

Study	Dependent Variable	Macroeconomic Variables	Methodology
Chin and Tay(2001)	Profit	GDP	Regression
Duval and Schiff (2011)	International visitor	GDP	Regression
Dobruszkes and Van Hamme (2011)	Number of seats	GDP	Regression
Jenatabadi and Ismail (2007)	Solidity ratio	Inflation rate Incentives	Regression
Jenatabadi and Ismail (2014)	Occupancy rate RPK Passenger market share Operating profit	Human development index Inflation rate	Structural equation models

The study's primary purpose is to reveal the variables that affect the financial performance of passenger transport companies operating in the airline sector. In the study, performance indicators that determine financial performance and the power of these indicators to explain the dependent variables and the direction of the relationship will be determined. At the same time, with the inclusion of the airline company belonging to Italy, a developed country and declared bankruptcy, in the study, the determinants of performances will be discussed from a different perspective, and it aims to contribute to the literature.

3.3. Variables

The variables to be used in the study are presented in the Table 12 below.

Table 12. Variable Definitions and Abbreviations

ABBREVIATIONS	VARIABLE DEFINITIONS
ROA	Return on Assets (Net Profit/Average Total Assests)
LEVRATIO	Leverage Ratio (Total Assets/ Equity)
CURRATIO	Current Ratio (Current Assets/Short-Term Liabilities)
ADMCOSTS	Administrative Costs (Selling, General & Administrat)

The main purpose of the analysis is to determine both the short-term and long-term relationships between the variables. For this reason, Vector Autoregressive (VAR) method has been applied.

In order to apply the VAR method, some certain assumptions must first be provided. These basic assumptions include autocorrelation, normality and varying variance. Additionally, the stationarity processes of the variables within the scope of time series have been examined. In this direction, first of all, the graphs of the level states of the series are given below.

3.4. Methodology

Purpose of this analysis is to examine the long and short-term relationships of the effects of the countries' economic development on the performances of their airline companies. Therefore, as a developed country Germany's Lufthansa Airlines and as a developing country Türkiye's Turkish Airlines are discussed in this analysis. Additionally, Italy's Alitalia Airlines has been included in the analysis as a control unit.

Return on Assets (ROA) is calculated by dividing the net profit for the period to total assets. It is a ratio that shows companies' profitability and the managements' capability. ROA can be high or low, depending on a company's finance components or changes in its capital structure. It is normal for companies that use foreign resources to a large extent, and thus have a heavy debt burden, to have lower ROA compared to companies that finance a significant part of their assets with their own resources (Doğan, 2016). The variable defined as the current ratio, on the other hand, shows the liquidity level of the company obtained by the ratio of the current assets of the company to its short-term liabilities. In the literature, there is a negative relationship between the current ratio, which expresses this liquidity level and ROA in some studies, while positive relationships are found in others. Finally, another variable included in the analysis is the company's administrative expenses.

The current ratio, one of the liquidity ratios, reflects the general liquidity situation of the enterprise and reveals whether the net working capital of the enterprise is sufficient (Akdoğan and Tenker, 2007). Working capital management can affect the profitability, risk and value of the enterprise (Smith, 1980). Effective liquidity management includes planning and controlling current assets and short-term liabilities in a way that eliminates the risk of failing to meet short-term liabilities and prevents over-investment in current assets. In order to increase firm value, a rational balance must be established between liquidity and profitability (Eljelly, 2004).

Managerial characteristics can be considered as one of the most important internal factors of firms. While the decisions taken by the managers within the framework of their qualifications affect the R&D, RDP strategies and investment decisions of the enterprise, on the other hand, it is important in terms of minimizing the possible negative effects of changes in national or international economic conditions outside the company that may be reflected on the company. Expenses arising from the management functions of the enterprises are called general administrative expenses in accounting. General administrative expenses consist of a large number of expenses that are related to the general management function of the enterprise and that cannot be directly related to production or the cost of goods sold. These expenses arising from the activities of the business management function can be recorded either in the General Administrative Expenses account in the uniform chart of accounts or in the appropriate accounts in the expense types classification. In addition, businesses can classify and track their expenses in sub-accounts in more detail, specific to their organizational structures, accounting and cost information systems. Expenses such as personnel, rent, depreciation, tax are both continuous and common expenses of almost all businesses. On the other hand, it is seen that expenses such as court and enforcement expenses, notary expenses, donations and aids are not continuous and occur in some periods depending on the special conditions of the enterprises (İbicioğlu et al., 2011).

Administrative expenses are among the indicators related to productivity in enterprises. Since it is the most important item of the operational expenses of the enterprises, it is also considered as a cost element. The fact that there is a negative relationship between management expenses and profitability, the increase in the expenses of the enterprise cannot be reflected in its profitability. The positive relationship indicates that the increase in expenses is reflected in the profitability.

In this analysis, the long and short-term relationships between the variables of Return on Assets (ROA), Leverage (Total Debt/Total Capital), Current Ratio and

Administrative Expenses have been examined by Vector Autoregressive (VAR) analysis for all three countries.

3.4.1. Unit root process. There are two main arguments used to determine whether the series are stationary which are correlogram and unit root test. Before analyzing time series statistically, it is necessary to examine whether the process that creates that series is stationary. In non-stationary series, some analysis results may be biased. In this context, stationarity in regression models is a condition that must be examined. There are more than one method used for the determination of stationarity. Augmented Dickey-Fuller test (ADF) is used to determine stationarity. These unit root tests show which of the stationary processes of the series are more compatible.

The ADF test relates to a set of tests known as the "Unit Root Test," which is the correct way for determining whether a time series is stationary or not. The unit root is a property of a non-stationary time series. A unit root is said to exist in a time series if the value of alpha in the following equation is 1.

$$Y_t = \alpha Y_{t-1} + \beta X_e + \varepsilon$$

Hypotheses;

H_0: $\alpha \geq 1$ (The series is not stationary)

H_1: $\alpha < 1$ (Series is stationary)

Where, Yt is the time series value at time t and Xe is an exogenous variable (a separate explanatory variable, which is also a time series).

A non-stationary time series is indicated by the presence of a unit root. In addition, the number of unit roots in a series correlates to the number of differencing operations necessary to make the series stationary (Prabhakaran, 2019).

3.4.1.1. Dickey Fuller test. Prior to the ADF test, the Dickey-Fuller test is administered. The Dickey-Fuller test is a unit root test that examines the null hypothesis that equals 1 in the following model equation. The coefficient of the first lag on Y is denoted by alpha (Prabhakaran, 2019).

Null Hypothesis (H_0): $\alpha = 1$

$$Y_t = c + \beta t + \alpha Y_{t-1} + \theta \Delta Y_{t-1} + e_t$$

where,

Y_{t-1}= lag 1 of time series

ΔY_{t-1} = first difference of the series at time (t-1)

Fundamentally, the null hypothesis is identical to that of the unit root test. Thus, Y(t-1) has a coefficient of 1, indicating the existence of a unit root. If the series is not rejected, it is assumed to be non-stationary.

The Augmented Dickey-Fuller test derived from the above equation and is one of the most prevalent forms of the Unit Root test.

3.4.1.2. Augmented Dickey Fuller test (ADF). "The Augmented Dickey Fuller test (ADF) is a frequent statistical test used to determine whether or not a given Time series is stable. It is one of the most often applied statistical tests for examining the stationary of a series" (Prabhakaran, 2019). In econometrics, an augmented Dickey-Fuller test (ADF) tests the null hypothesis that a unit root exists in the time series, while the alternative hypothesis differs depending on which version of the test is used, but it is usually either stationary or trend-stationary. The augmented dickey-fuller test is a continuation of the dickey-fuller test, which removes autocorrelation from the series and performs tests similar to the dickey-fuller procedure. It is an augmented version of the Dickey-Fuller test for a larger and more complex set of time series models.

The ADF test employs the following regression model:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{k} \infty_i \Delta Y_{t-i} + \varepsilon_t$$

"where, Δ = the first difference operator; ΔYt−i = lagged values of the dependent variable, for example, ΔYt−1 = (Yt−1 − Yt−2), ΔYt−2 = (Yt−2 − Yt−3), and so forth; εt is a white noise error term; β1 is a constant; β2 is a slope coefficient on time trend t; δ is a coefficient of lagged Yt−1; and Yt is the dependent variable" (Guney and Komba, 2016).

3.4.2. Model of vector autoregressive (VAR). VAR analysis reveals the interaction between the variables and the long-term relationships between the variables. With the var model estimation, the single-equation autoregressive time series expands into a multi-equation autoregressive time series vector of variables. In the VAR equation system, the variables are determined as endogenous and exogenous variables. However, Sims (1980) criticized the definitions of endogenous and extrinsic variables in the simultaneous equation system and developed the VAR model in which all variables are considered endogenous, based on the Granger causality test model.

The VAR model is a multidimensional time series model in which all the variables participating in the model are defined on the lagged values of itself and other variables, where the information criteria and the degree of lag are determined. The model is a set of "k" time series regressions in which the lagged values of the "k" series are their independent variables. The system in which the lag length of each equation is equal and the same, where "p" as a lag length determined by the information criteria, is called a VAR(p) system and can be expressed as;

$$\begin{aligned} ROA_t = \beta_{10} &+ \beta_{11}ROA_{t-1} + \cdots + \beta_{1p}ROA_{t-p} + \gamma_{11}LEVRATIO_{t-1} + \cdots + \gamma_{1p}LEVRATIO_{t-p} + \cdots \\ &+ \delta_{11}CURRATIO_{t-1} + \cdots + \delta_{1p}CURRATIO_{t-p} + \delta_{11}ADMCOSTS_{t-1} + \cdots \\ &+ \delta_{1p}ADMCOSTS_{t-p} + \varepsilon_{1t} \end{aligned}$$

$$\begin{aligned} LEVRATIO_t = \beta_{20} &+ \beta_{21}ROA_{t-1} + \cdots + \beta_{2p}ROA_{t-p} + \gamma_{21}LEVRATIO_{t-1} + \cdots + \gamma_{2p}LEVRATIO_{t-p} \\ &+ \cdots + \delta_{21}CURRATIO_{t-1} + \cdots + \delta_{2p}CURRATIO_{t-p} + \delta_{21}ADMCOSTS_{t-1} + \cdots \\ &+ \delta_{2p}ADMCOSTS_{t-p} + \varepsilon_{2t} \end{aligned}$$

$$\begin{aligned} CURRATIO_t = \beta_{30} &+ \beta_{31}ROA_{t-1} + \cdots + \beta_{3p}ROA_{t-p} + \gamma_{31}LEVRATIO_{t-1} + \cdots + \gamma_{3p}LEVRATIO_{t-p} \\ &+ \cdots + \delta_{31}CURRATIO_{t-1} + \cdots + \delta_{3p}CURRATIO_{t-p} + \delta_{31}ADMCOSTS_{t-1} + \cdots \\ &+ \delta_{3p}ADMCOSTS_{t-p} + \varepsilon_{3t} \end{aligned}$$

$$\begin{aligned} ADMCOSTS_t = \beta_{40} &+ \beta_{41}ROA_{t-1} + \cdots + \beta_{4p}ROA_{t-p} + \gamma_{41}LEVRATIO_{t-1} + \cdots + \gamma_{4p}LEVRATIO_{t-p} \\ &+ \cdots + \delta_{41}CURRATIO_{t-1} + \cdots + \delta_{4p}CURRATIO_{t-p} + \delta_{41}ADMCOSTS_{t-1} + \cdots \\ &+ \delta_{4p}ADMCOSTS_{t-p} + \varepsilon_{4t} \end{aligned}$$

The abbreviated version of these systems of equations is as follows:

$$\begin{aligned} ROA_t = \beta_{10} &+ \sum_{i=1}^{p} \beta_{1i}ROA_{t-i} + \sum_{i=1}^{p} \gamma_{1i}LEVRATIO_{t-i} + \sum_{i=1}^{p} \delta_{1i}CURRATIO_{t-i} + \sum_{i=1}^{p} \delta_{1i}ADMCOSTS_{t-i} \\ &+ \varepsilon_{1t} \end{aligned}$$

$$LEVRATIO_t = \beta_{20} + \sum_{i=1}^{p} \beta_{2i} ROA_{t-i} + \sum_{i=1}^{p} \gamma_{2i} LEVRATIO_{t-i} + \sum_{i=1}^{p} \delta_{2i} CURRATIO_{t-i} + \sum_{i=1}^{p} \delta_{2i} ADMCOSTS_{t-i} + \varepsilon_{2t}$$

$$CURRATIO_t = \beta_{30} + \sum_{i=1}^{p} \beta_{3i} ROA_{t-i} + \sum_{i=1}^{p} \gamma_{3i} LEVRATIO_{t-i} + \sum_{i=1}^{p} \delta_{3i} CURRATIO_{t-i} + \sum_{i=1}^{p} \delta_{3i} ADMCOSTS_{t-i} + \varepsilon_{3t}$$

$$ADMCOST_t = \beta_{40} + \sum_{i=1}^{p} \beta_{4i} ROA_{t-i} + \sum_{i=1}^{p} \gamma_{4i} LEVRATIO_{t-i} + \sum_{i=1}^{p} \delta_{4i} CURRATIO_{t-i} + \sum_{i=1}^{p} \delta_{4i} ADMCOSTS_{t-i} + \varepsilon_{4t}$$

This system of equations is a four-dimensional VAR model because it contains four variables.The direct interpretation of the parameters obtained from the VAR model estimation is not very meaningful. For this reason, inferences are made for the variables by performing impulse-response and variance decomposition analysis. Impulse-response analysis provides the measurement of the response of each variable in the system to a shock of one standard deviation in other variables in the system during a certain period. Variance decomposition explains the percentage change of a variable against a shock in another variable after "k" periods. In the VAR model, the statistical significance of the parameters is oblivious and the relationships between the variables are analyzed. In order to use the VAR model, all variables must be stationary and certain assumptions must be provided.

3.4.2.1. Lagrange multiplier (LM) test. The Lagrange multiplier (LM) test is used to check for the presence of a “p”-order autocorrelation as well as the presence of from 1st order until "p"-order autocorrelation.

The test statistic and hypothesis are as follow:

$$H_0\!: \rho_1 = \rho_2 = \cdots = \rho_p = 0$$

$$H_0\!: \rho_1 \neq \rho_2 \neq \cdots = \rho_p \neq 0$$

$$LM = nR^2 \sim \chi^2_{\alpha;p}$$

In thisstatistics, R^2 of the secondary equation which included the “n” is the number of observations and “p”-order autoregression error term, is used.

***3.4.2.2. White* test.** The White test is one of the most used tests in the diagnosis of heteroscedasticity as it can include all independent variables in the model. As Y_i being a dependent variable;

$$Y_i = \beta_1 + \beta_2 \chi_{2i} + \cdots + \beta_k \chi_{ki} + u_i$$

In a model like this, the estimated values of the error terms are obtained by using the white test side regression models and a second regression is established by these values and the R^2 value of this model is calculated. The test statistic is calculated with this R^2 value as follows:

$$White = nR^2 \sim \chi^2$$

If the test statistic is greater than the table value of χ^2, the alternative hypothesis stating that there is varying variance is rejected and the H_0 hypothesis is accepted.

Chapter 4.

Analysis

In practice, short and long-term relationships of Return on Assets (ROA), Leverage Ratio, Current Ratio and Administrative costs variables for Turkish Airlines, Alitalia and Lufthansa airlines have been examined. In the application, data for the year 1997 – 2021 for two companies, Turkish Airlines and Lufthansa, have been used. In addition, three different time series analyzes have been made for the Alitalia airline company, which is considered as the control group, using the 1997 - 2008 annual period data. Data’s are obtained from Reuters.

The main purpose of the analysis is to determine both the short-term and long-term relationships between the variables. For this reason, Vector Autoregressive (VAR) method has been applied.

In order to apply the VAR method, some certain assumptions must first be provided.These basic assumptions include autocorrelation, normality and varying variance. Additionally, the stationarity processes of the variables within the scope of time series have been examined.

4.1. Analysis About Turkish Airlines

Primarily, the analysis findings of the Turkish Airlines airline company for Turkey, which belongs to the developing country group, are given. First of all, the graphs of the level states of the variables are shown as follow:

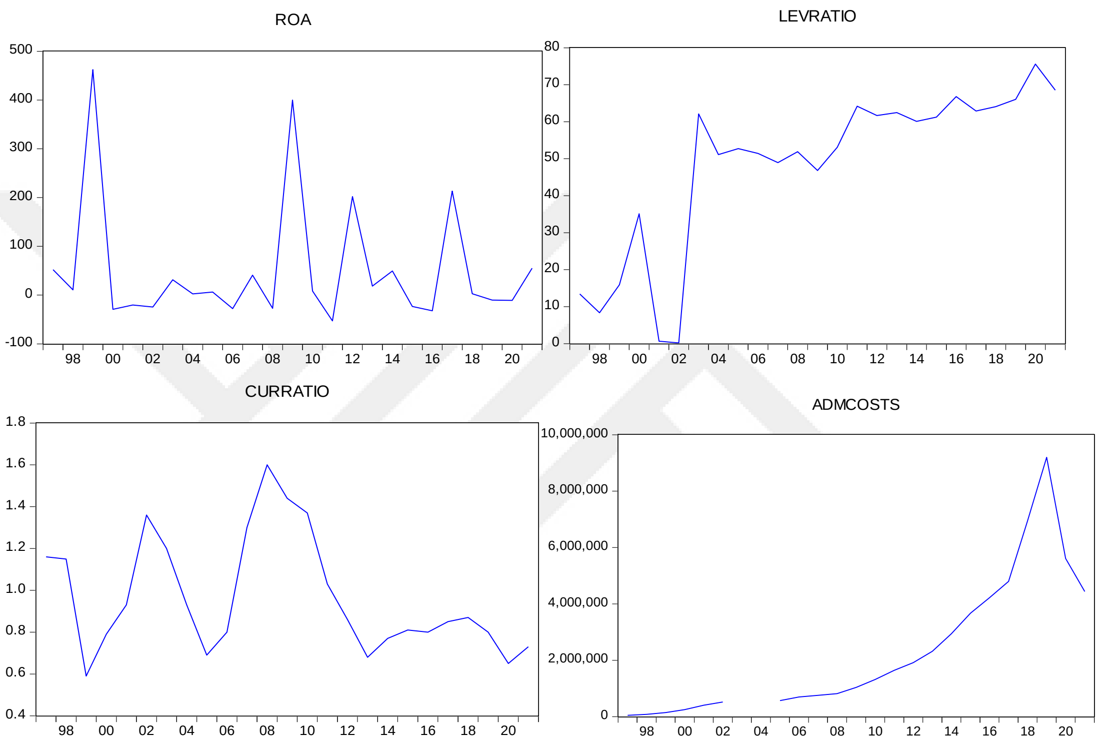


Figure 18. Graph of Level States of Variables for Turkish Airlines

When the time graphs of the series are examined, it is observed that they are not stationary in mean and variance. For this reason, the next step is the implementation of the stationarity tests. In addition, the logarithm of the administrative expenses variable has been taken and its scale has been reduced.

4.1.1. Unit root test results for Turkish Airlines. The unit root processes of the series were examined with Breakages ADF tests. Test results are listed below.

Table 13. Unit root test with Break Test for Turkish Airlines

Series	t Statistic	1% Level	5% Level	10% Level	Prob*	Decision
ROA	-6.676	-5.347	-4.859	-4.607	<0.01*	I(0) Stable in level
LEVRATIO	-9.125	-5.067	-4.524	-4.261	<0.01*	I(0) Stable in level
CURRATIO	-6.097	-5.719	-5.175	-4.893	<0.01*	I(0) Stable in level
ADMCOSTS	-4.136	-5.347	-4.859	-4.607	0.294	I(0) Not Stable in level
ΔADMCOSTS	-6.670	-4.949	-4.443	-4.193	<0.01*	I(0) Stable in level

*; It shows significance at 1%

The results obtained were evaluated at the 1% significance level. According to the refractive unit root test result in Table 13, ROA, LEVRATIO and CURRATIO series are found to be stationary because their t-statistics values calculated at the I(0) level and the significance level chosen as 1% are absolutely smaller than the Vogelsang criterion.Since the "t" statistic of the ADMCOSTS variable is greater than 1% and 5% , so it is not stationary at the level (0.294>0.05) and it is concluded that it is stationary when the first difference is analyzed.

4.1.2. Vector autoregressive (VAR) model estimation for Turkish Airlines. According to the information criteria (Akaike, Schwarz, Hannan-Quinn) for the ROA, LEVRATIO, CURRATIO and ΔLADMCOSTS variables, the appropriate lag length was determined is 1 (One) and the VAR(1) model estimation is as follows:

Table 14. VAR Model Estimation for Turkish Airlines

	ROA_{t-1}	$LEVRATIO_{t-1}$	$CURRATIO_{t-1}$	$\Delta ADMCOSTS_{t-1}$
ROA	*-0.3025*	*-0.0322*	*0.0019*	*-0.0003*
t-statistics	*(-1.27)*	*(1.87)*	*(-0.04)*	*(1.05)*
LEVRATIO	*-1.8056*	*1.0296*	*-0.0058*	*-0.0027*
t-statistics	*(-0.74)*	*(5.84)*	*(-1.42)*	*(0.60)*
CURRATIO	*181.261*	*4.7293*	*0.6041*	*0.0779*
t-statistics	*(1.48)*	*(0.53)*	*(2.91)*	*(0.45)*
ΔADMCOSTS	*-64.1013*	*3.5463*	*-0.4543*	*0.4100*
t-statistics	*(-0.30)*	*(0.23)*	*(-1.28)*	*(1.40)*
Constant	*16.5098*	*-8.3501*	*0.7867*	*0.1409*
t-statistics	*(0.07)*	*(-0.52)*	*(2.11)*	*(0.45)*

Before proceeding to the analysis of the estimated model, whether it provides autocorrelation and varying variance assumptions was examined with the relevant tests.

4.1.3. Lagrange multiplier (LM) test for Turkish Airlines. The LM test result applied to examine the autocorrelation assumption is as follows:

Table 15. LM Test Result for Turkish Airlines

Lags	LM-Stat	Prob
1	*29.571*	*0.051*
2	*32.720*	*0.080*
3	*14.797*	*0.539*
4	*12.656*	*0.697*
5	*5.194*	*0.994*
6	*12.087*	*0.737*
7	*9.462*	*0.893*
8	*9.257*	*0.902*
9	*22.571*	*0.120*
10	*28.889*	*0.054*
11	*32.258*	*0.090*
12	*16.641*	*0.409*
13	*23.552*	*0.099*
14	*11.689*	*0.765*
15	*4.307*	*0.998*
16	*4.544*	*0.997*

Probs from chi-square with 16 df.

The appropriate delay for the LM test was determined as 16, and since the probability values of all LM test statistics from the first order to the 16-order are greater than 5%, the H_0 hypothesis cannot be rejected and it is concluded that there is no autocorrelation.

4.1.4. White test for Turkish Airlines. The result of the White test statistic and probability value applied to examine the heteroscedasticity status are as follows:

Table 16. White Test Result for Turkish Airlines

Chi-sq	Df	Prob
152.6638	*140*	*0.219*

When the test result is examined, since the probability value of the white test statistic is greater than 5% (0.219), the H_0 hypothesis cannot be rejected and it is concluded that there is no problem of changing variance.

4.1.5. Impulse – response analysis for Turkish Airlines. In order to analyze the relationship between the variables as a result of the VAR model estimation, the impulse - response graphs and their periodic values are as follows:

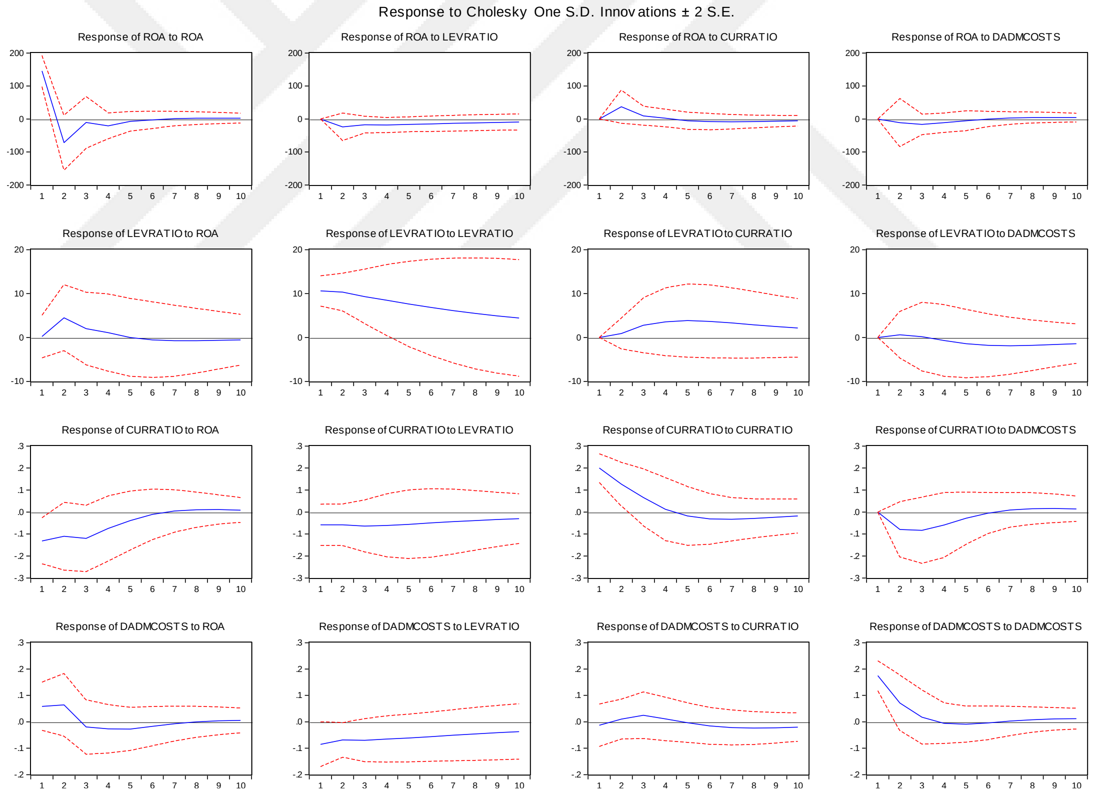


Figure 19. Impulse – Response for Turkish Airlines

Tabulated values of impulse – response function details are as follows:

Table 17. Impulse – Response to Cholesky

Response of ROA:				
Period	***ROA***	***LEVRATIO***	***CURRATIO***	***ΔADMCOSTS***
2	*-71.973*	*-24.219*	*37.046*	*-11.199*
5	*-7.521*	*-16.521*	*-5.650*	*-5.596*
10	*2.1286*	*-9.2848*	*-5.290*	*3.873*
Response of LEVRATIO:	***ROA***	***LEVRATIO***	***CURRATIO***	***ΔADMCOSTS***
Period				
1	*0.2067*	*10.5803*	*0.0000*	*0.0000*
5	*-0.0088*	*7.6173*	*3.8222*	*-1.4060*
10	*-0.5346*	*4.4117*	*2.1497*	*-1.4307*
Response of CURRATIO:	***ROA***	***LEVRATIO***	***CURRATIO***	***ΔADMCOSTS***
Period				
1	*-0.1315*	*-0.0583*	*0.1998*	*0.0000*
5	*-0.0392*	*-0.0562*	*-0.0181*	*-0.0288*
10	*0.0086*	*-0.0304*	*-0.0182*	*0.0142*
Response of ΔADMCOSTS:	***ROA***	***LEVRATIO***	***CURRATIO***	***ΔADMCOSTS***
Period				
1	*0.0587*	*-0.0852*	*-0.0129*	*0.1747*
5	*-0.0271*	*-0.0616*	*-0.0035*	*-0.0089*
10	*0.0050*	*-0.0368*	*-0.0203*	*0.0118*

In the impulse-response functions, the direction and magnitude of the effect of a standard deviation shock given to the corresponding variable on the vertical axis is the direction and magnitude of the effect of the shock on the other variable, and the period on the horizontal axis. Dashed lines represent 2 standard deviation confidence intervals.

When the second chart in line 1st is examined, when ±1 shock occurred in the leverage ratio, the ROA series gave an opposite reaction from the first periods to the last period. It has given the highest negative reaction in the second period, that is, in the short period. Thus, it is concluded that there is a negative relationship between leverage ratio and ROA.

When the third graph in line 1st is examined, when ±1 shock occurs at the current rate, the ROA series gives a positive reaction in the first periods and it is seen that it has a negative response in the long term. When the 1st line and fourth chart is examined, when ±1 shock occurs in administrative expenses, the ROA series reacts negatively in the first periods; it is seen that there is a positive response in the long run.

4.1.6. Variance decomposition. After the period related to variance separation analysis, the percentage change in one variable against the shock occurring in another variable can be examined. Variance decomposition analysis charts and values are as follow, respectively.

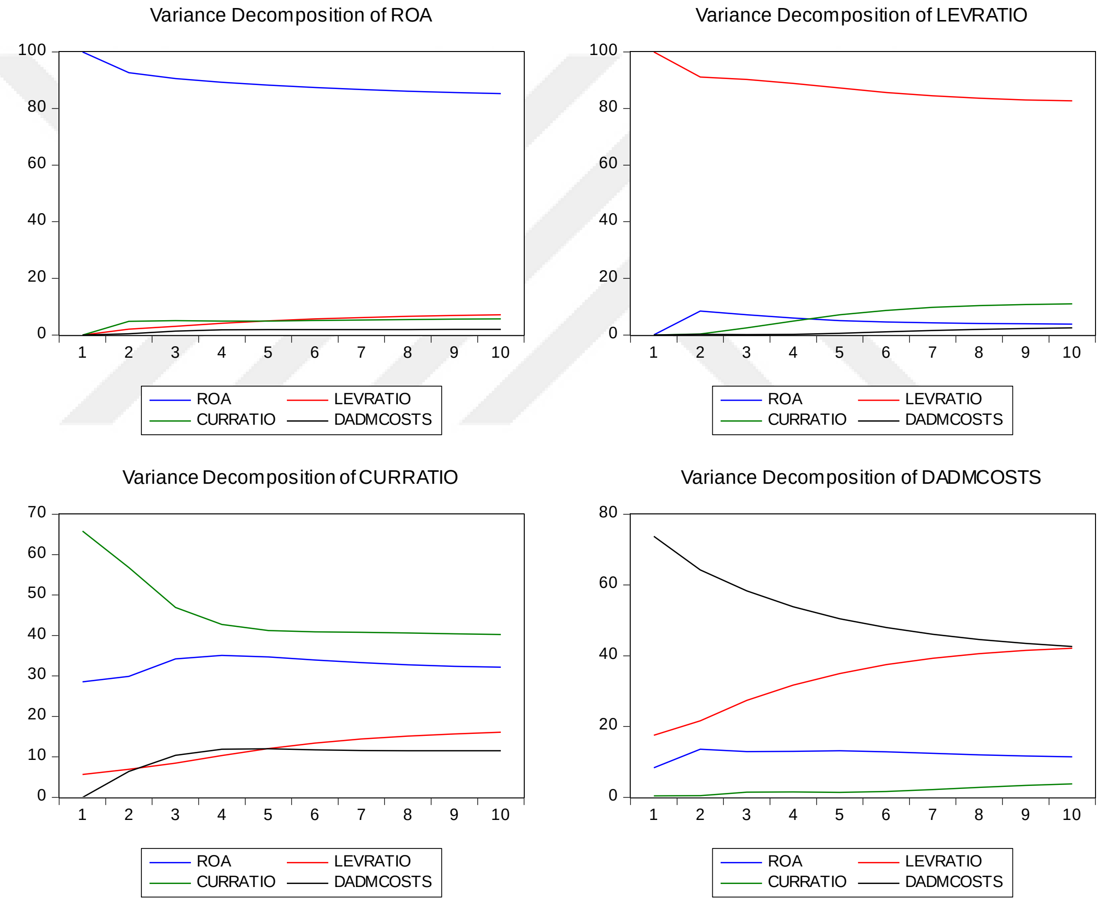


Figure 20. Variance Decomposition for Turkish Airlines

Table 18. Variance Decomposition Values

Variance Decomposition of ROA	ROA	LEVRATIO	CURRATIO	∆ ADMCOSTS
1	100.000	0.0000	0.0000	0.0000
5	88.2616	4.9547	4.9163	1.8672
10	85.2808	7.1006	5.6326	1.9859
Variance Decomposition of LEVRATIO	**ROA**	**LEVRATIO**	**CURRATIO**	**∆ ADMCOSTS**
1	0.0381	99.9618	0.0000	0.0000
5	5.0759	87.2253	7.1190	0.5796
10	3.8358	82.6969	10.9895	2.4776
Variance Decomposition of CURRATIO	**ROA**	**LEVRATIO**	**CURRATIO**	**∆ ADMCOSTS**
1	28.5366	5.6173	65.8460	0.0000
5	34.7191	12.0421	41.2372	12.0015
10	32.1429	16.0810	40.2531	11.5227
Variance Decomposition of ∆ ADMCOSTS	**ROA**	**LEVRATIO**	**CURRATIO**	**∆ ADMCOSTS**
1	8.3324	17.5407	0.4046	73.7221
5	13.15562	34.9619	1.4054	50.4763
10	11.4484	42.1387	3.7646	42.6482

According to the variance decomposition result, ROA, that is, the return on assets of the company, is mostly affected by its own lagged values, around 88% on average. In addition, while the leverage ratio, which has the highest rate of 7% among other variables, explains the shock in ROA. The current ratio variable of around 6% also contributes to the explanation of ROA.

As a result, the evaluations of Turkish Airlines within the scope of the developing country are as follow:

Leverage ratio and management expenses, ROA, which is the return on assets of the company, react negatively in the short run and an opposite relationship has been found between them. In addition, a positive relationship has been found between the return on assets ratio of the company and the current ratio. In the long term, while the leverage ratio continues its negative reaction; administrative expenses, on the other hand, have given a positive reaction. For this reason, while there is a negative relationship between ROA and leverage ratio in the long run. It has been found that there is a positive relationship between ROA and administrative expenses.

4.2. Analysis About Lufthansa

First of all, the analysis findings of Lufthansa airline company for Germany, which belongs to the developed country group, are given. Lufthansa represents the developed country group. In addition, the period between 1999 and 2021, which is the same as Turkish Airlines, is discussed. First of all, the graphs of the level states of the variables are shown as follow:

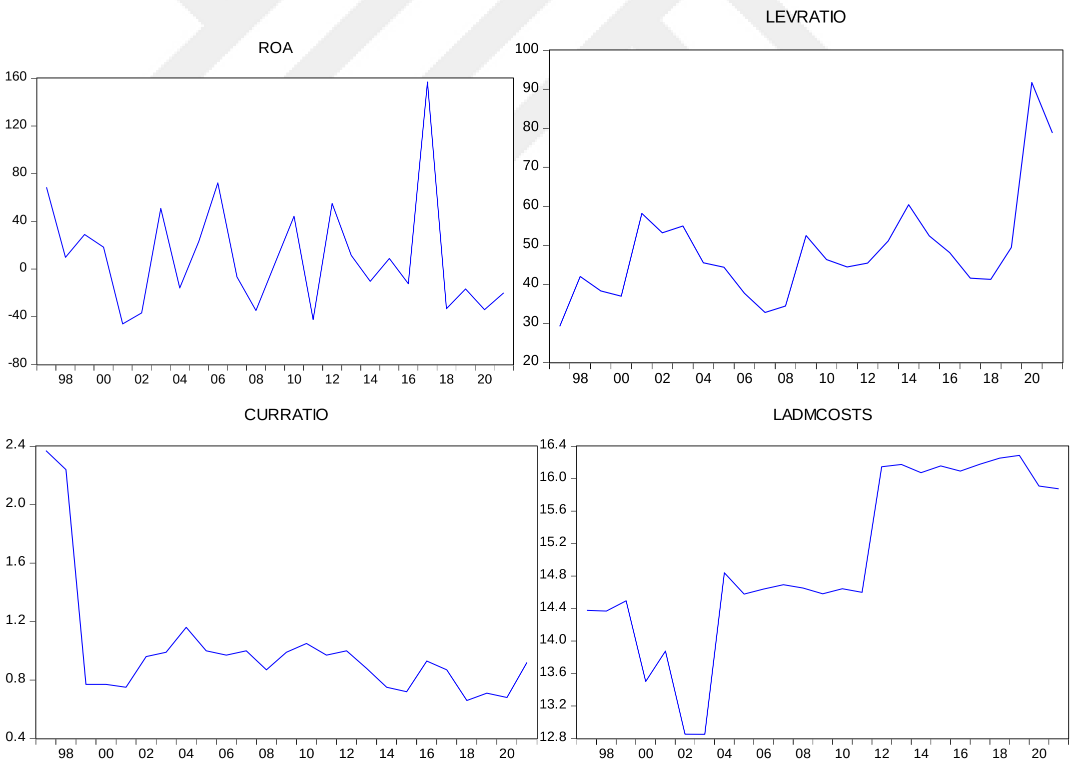


Figure 21. Graph of level states of variables for Lufthansa

When the time graphs of the series are examined, it is observed that they are not stationary in mean and variance. For this reason, the next step is the implementation of the stationarity tests. In addition, the logarithm of the administrative expenses variable has been taken and its scale has been reduced.

4.2.1. Unit root test results for Lufthansa. The unit root processes of the series were examined with the Fractured ADF tests. Test results are listed below.

Table 19. Unit Root Test with Break Test for Lufthansa

Series	t Statistic	1% Level	5% Level	10% Level	Prob*	Decision
ROA	-6.329	-5.719	-5.175	-4.893	<0.01*	I(0) Stable in level
LEVRATIO	-4.116	-5.719	-5.175	-4.893	0.446	I(0) Not stable in level
CURRATIO	-4.227	-5.719	-5.175	-4.893	0.377	I(0) Not stable in level
ADMCOSTS	-4.086	-5.347	-4.859	-4.607	0.319	I(0) Not stable in level
ΔLEVRATIO	-6.538	-4.949	-4.443	-4.193	<0.01*	I(0) Stable in level
Δ CURRATIO	-4.967	-5.347	-4.859	-4.607	<0.01*	I(0) Stable in level
Δ ADMCOSTS	-5.208	-4.949	-4.443	-4.193	<0.01*	I(0) Stable in level

*; It shows significance at 1%

The results obtained were evaluated at the 1% significance level. According to the refractive unit root test result in Table 19, it was concluded that the t-statistic values calculated at the I(0) level of the ROA series and the significance level chosen as 1% are absolutely lower than the Vogelsang criterion, so they are stationary. Since the t-statistics probability values of LEVRATIO, CURRATIO and ADMCOSTS variables are greater than 1% and 5%, they are not stationary at the level and it is concluded that they are stationary when the first difference is taken.

4.2.2. Vector autoregressive (VAR) model estimation for Lufthansa. According to the information criteria (Akaike, Schwarz, Hannan-Quinn) for the ROA, ΔLEVRATIO, ΔCURRATIO and ΔLADMCOSTS variables, the appropriate lag length was determined as 1 and the VAR (1) model estimation is as follows:

Table 20. VAR Model Estimation for Lufthansa Airlines

	ROA_{t-1}	$\Delta LEVRATIO_{t-1}$	$\Delta CURRATIO_{t-1}$	$\Delta ADMCOSTS_{t-1}$	Constant
ROA	-0.3075	-0.9918	5.7489	-1.0109	13.0484
t-statistics	(-1.26)	(-1.04)	(0.17)	(-0.05)	(1.16)
$\Delta LEVRATIO$	-0.0538	-0.2453	0.9145	-1.6426	2.9010
t-statistics	(-0.84)	(-0.98)	(0.10)	(-0.36)	(0.98)
$\Delta CURRATIO$	0.0019	-0.0058	0.6041	-0.4543	0.7867
t-statistics	(-0.04)	(-1.42)	(2.91)	(-1.28)	(2.11)
$\Delta ADMCOSTS$	0.0018	-0.0073	0.6811	-0.2274	0.1352
t-statistics	(0.58)	(-0.60)	(1.64)	(-1.05)	(0.94)

Before proceeding to the analysis of the estimated model, whether it provides autocorrelation and varying variance assumptions have been examined with the relevant tests.

4.2.3. Lagrange multiplier (LM) test for Lufthansa. The LM test result applied to examine the autocorrelation assumption is as follow:

Table 21. LM Test Result for Lufthansa

Lags	LM-Stat	Prob
1	*30.178*	*0.052*
2	*15.034*	*0.522*
3	*28.870*	*0.024*
4	*10.860*	*0.818*
5	*15.420*	*0.494*
6	*5.505*	*0.992*
7	*16.006*	*0.452*
8	*13.889*	*0.607*
9	*10.526*	*0.837*
10	*7.982*	*0.949*
11	*11.685*	*0.765*
12	*10.208*	*0.855*
13	*15.688*	*0.474*
14	*13.984*	*0.599*
15	*13.124*	*0.663*
16	*24.249*	*0.084*

Probs from chi-square with 16 df.

The appropriate delay for the LM test has been determined as 16, and since the probability values of all LM test statistics from the first to the 16th order are greater than 5%, the H_0 hypothesis cannot be rejected and it is concluded that there is no autocorrelation.

4.2.4. White test for Lufthansa

The result of the White test statistic and probability value applied to examine the heteroscedasticity status are as follow:

Table 22. White Test Result for Lufthansa Airlines

Chi-sq	**Df**	**Prob**
148.2211	*140*	*0.301*

When the test result is examined, since the probability value of the white test statistic is greater than 5% (0.301), the H_0 hypothesis cannot be rejected and it is concluded that there is no problem of changing variance.

4.2.5. Impulse – response analysis for Lufthansa. In order to analyze the relationship between the variables as a result of the VAR model estimation, the impulse response graphs and their periodic values are as follow:

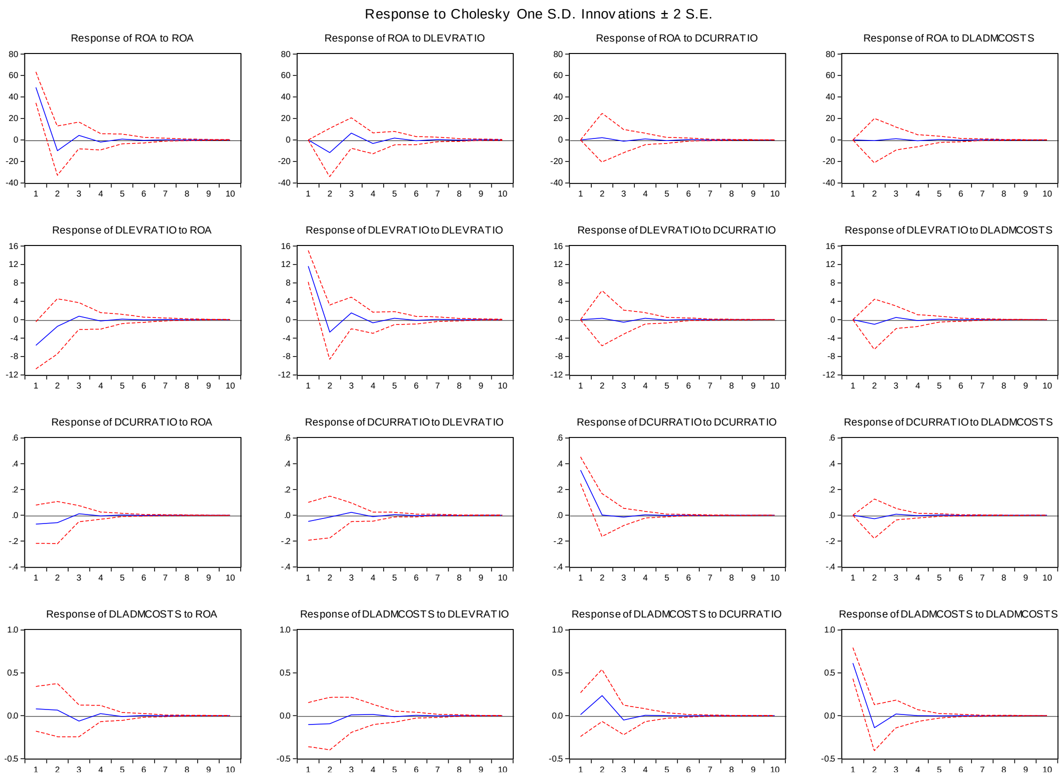


Figure 22. Impulse – Response for Lufthansa

The values of the impulse – response function graphs are as follow. In impulse-response functions, a standard deviation given to the relevant variable on the vertical axis is the direction and magnitude of the impact of the shock on the other variable, and the period (period) is on the horizontal axis. The dashed lines represent 2 standard deviation confidence intervals.

Table 23. Impulse – Response to Cholesky for Lufthansa

Response of ROA:				
Period	***ROA***	***LEVRATIO***	***CURRATIO***	***ΔADMCOSTS***
2	*-9.9646*	*-11.694*	*1.9966*	*-0.6192*
5	*0.8162*	*1.6070*	*-0.5206*	*0.4389*
10	*-0.0146*	*-0.0342*	*0.0127*	*-0.0105*
Response of LEVRATIO:	***ROA***	***LEVRATIO***	***CURRATIO***	***ΔADMCOSTS***
Period				
1	*-5.6031*	*11.6247*	*0.0000*	*0.0000*
5	*0.1289*	*0.3110*	*-0.1178*	*0.0924*
10	*-0.0024*	*-0.0059*	*0.0022*	*-0.0017*
Response of CURRATIO:	***ROA***	***LEVRATIO***	***CURRATIO***	***ΔADMCOSTS***
Period				
1	*-0.0688*	*-0.0469*	*0.3496*	*0.0000*
5	*0.0017*	*0.0045*	*-0.0017*	*0.0013*
10	*-0.0003*	*-0.0008*	*0.0003*	*-0.0002*
Response of ΔADMCOSTS:	***ROA***	***LEVRATIO***	***CURRATIO***	***ΔADMCOSTS***
Period				
1	*0.0802*	*-0.1041*	*0.0131*	*0.6124*
5	*-0.0091*	*-0.0112*	*0.0015*	*-0.0019*
10	*0.0014*	*0.0032*	*-0.0011*	*0.0005*

When the second graph in line 1st is examined, when a ±1 shock occurred in the leverage ratio, the ROA series gave a negative reaction in the first periods. It has given the highest negative reaction in the second period, that is, in the short period. In the long run, it is concluded that there is a negative relationship between the leverage ratio and ROA with the return of the old period balance. It gives a net negative reaction in the short term, but in the long term it gives a negative response, although its effect decreases.

When the 22 graph in line 1st is examined, it is determined that the ROA series gives a positive reaction in the short term when ±1 shock occurs at the current rate, while when the other periods are examined, there are negative and positive reactions and volatility reactions. This shows that the direction of the reaction is different. In the long term, although its effect decreases, it remains in the balance of the old period.

In addition, when the 1st line and fourth chart is examined, when ±1 shock occurs in administrative expenses, the ROA series reacts negatively in the first periods. Despite giving a positive reaction in the medium term; In the long run, its effect is very low and it is below the old period equilibrium.

4.2.6. Variance decomposition for Lufthansa. After the period of variance decomposition analysis, the percentage change of a variable against a shock in another variable can be examined. Variance decomposition analysis graphics and values are as follow, respectively.

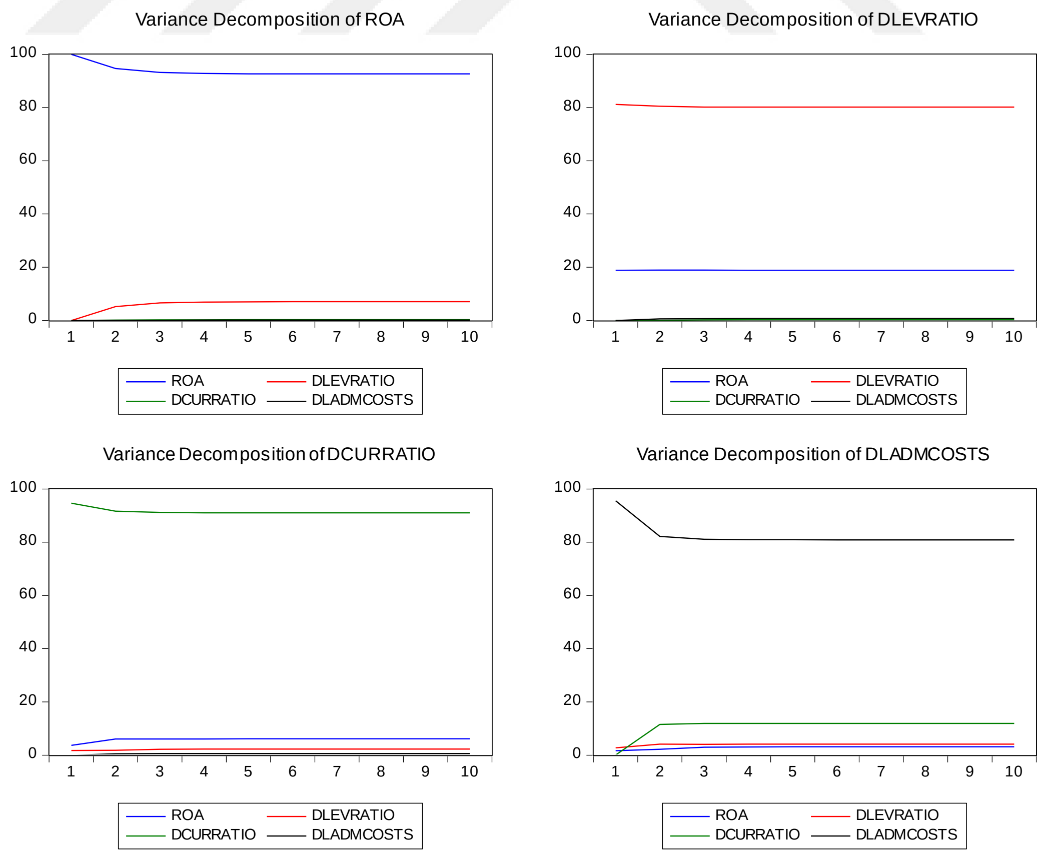


Figure 23. Variance Decomposition for Lufthansa

Table 24. Variance Decomposition Values for Lufthansa

Variance Decomposition of ROA	ROA	LEVRATIO	CURRATIO	ΔADMCOSTS
1	100.000	0.0000	0.0000	0.0000
5	92.6736	6.9960	0.2336	0.0967
10	92.6433	7.0207	0.2369	0.0989
Variance Decomposition of LEVRATIO	**ROA**	**LEVRATIO**	**CURRATIO**	**ΔADMCOSTS**
1	18.8524	81.1475	0.0000	0.0000
5	18.8537	80.1555	0.2737	0.7169
10	18.8525	80.1537	0.2756	0.7180
Variance Decomposition of CURRATIO	**ROA**	**LEVRATIO**	**CURRATIO**	**ΔADMCOSTS**
1	3.6714	1.7060	94.6224	0.0000
5	6.0870	2.2866	91.0389	0.5872
10	6.0874	2.2903	91.0346	0.5876
Variance Decomposition of ΔADMCOSTS	**ROA**	**LEVRATIO**	**CURRATIO**	**ΔADMCOSTS**
1	1.6390	2.7654	0.0443	95.5511
5	3.0820	4.1251	11.8957	80.8970
10	3.0852	4.1352	11.8946	80.8849

According to the variance decomposition result, ROA, that is, the return on assets of the company, is mostly affected by its own lagged values. This result shows that the company has a negative or positive sustainability in terms of return on assets. In addition, the leverage ratio, which has the highest rate of 7% among other variables, contributes to the explanation of the shock to be experienced in ROA. It is determined that the effects of other variables are very small.

As a result, the evaluations of the LUFTANHSA within the scope of the developing country are as follow; the leverage ratio, ROA, that is, the return on assets of the company, gives the biggest negative reaction compared to other variables, and there is an opposite relationship between them. Leverage ratio and administrative expenses have negative relations with the return on assets of the company. In the long run, ROA continues to react negatively to leverage ratio and administrative expenses; has reacted positively to the current ratio in the recent period.

4.3. Analysis About Alitalia

First of all, analysis findings of Alitalia airline for Italy, which belongs to the developed country group, are given. Italy is considered here as the control group. Due to missing observations, 1997 – 2007 annual data has been used.

First of all, the graphs of the level states of the variables are shown as follow:

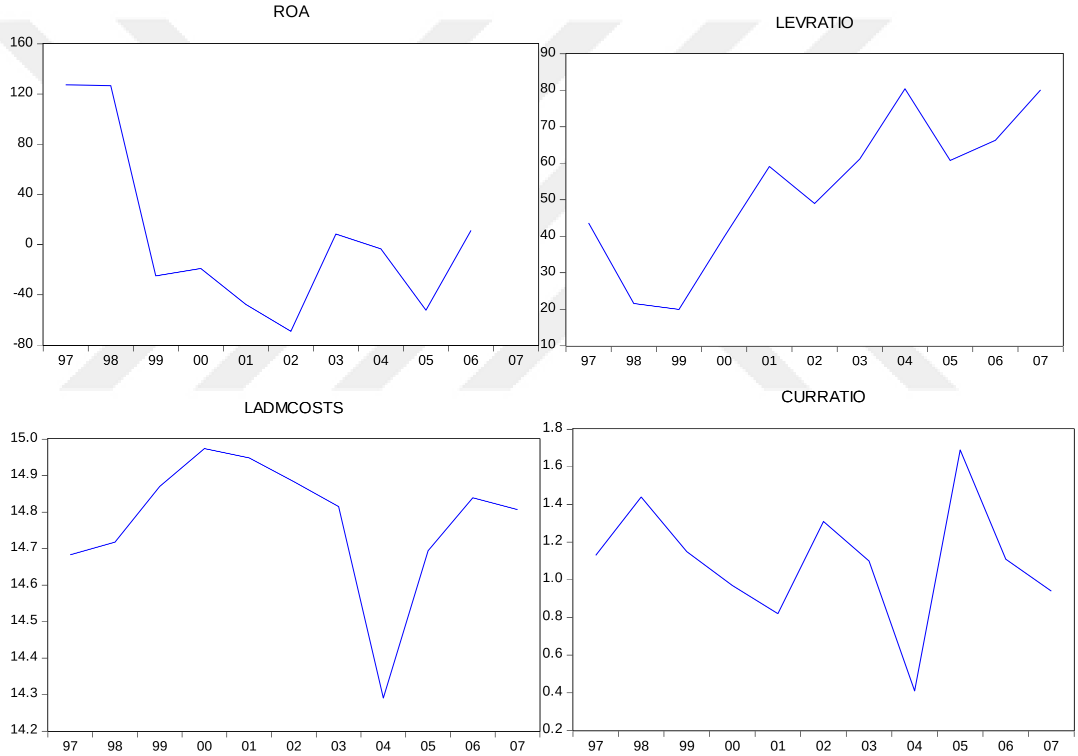


Figure 24. Graph of Level States of Variables for Alitalia

When the time graphs of the series are examined, it is observed that they are not stationary in mean and variance. For this reason, the next step is the implementation of the stationarity tests. In addition, the logarithm of the administrative expenses variable has been taken and its scale has been reduced.

4.3.1. Unit root test results for Alitalia. The unit root processes of the series have been examined with the Fractured ADF tests. Test results are listed below.

Table 25. Unit root test with Break Test for Alitalia

Series	t Statistic	1% Level	5% Level	10% Level	Prob*	Decision
ROA	-6.882	-4.949	-4.443	-4.193	<0.01*	I(0) Stable in level
LEVRATIO	-7.460	-5.067	-4.524	-4.261	<0.01*	I(0) Stable in level
CURRATIO	-5.818	-5.719	-5.175	-4.893	<0.01*	I(0) Stable in level
ADMCOSTS	-7.582	-5.347	-4.859	-4.607	<0.01*	I(0) Stable in level

*; It shows significance at 1%

The results obtained were evaluated at the 1% significance level. According to the refractive unit root test result in Table 25, all series including ROA, LEVRATIO, CURRATIO and ADMCOSTS are stationary because their t-statistic values calculated at the I(0) level and the significance level chosen as 1% are absolutely smaller than the Vogelsang criterion concluded.

4.3.2. Vector autoregressive (VAR) model estimation for Alitalia. According to the information criteria (Akaike, Schwarz, Hannan-Quinn) for the ROA, ΔLEVRATIO, ΔCURRATIO and ΔLADMCOSTS variables, the appropriate lag length was determined as 1 and the VAR(1) model estimation is as follows:

Table 26. VAR Model Estimation for Alitalia

	ROA_{t-1}	$LEVRATIO_{t-1}$	$CURRATIO_{t-1}$	$\Delta ADMCOSTS_{t-1}$	**Constant**
ROA	*0.4962*	*1.0778*	*73.7321*	*27.7207*	*-553.8346*
t-statistics	*(1.25)*	*(0.62)*	*(1.09)*	*(0.18)*	*(-0.24)*
$LEVRATIO$	*-0.1276*	*0.6546*	*7.7658*	*16.6622*	*-234.7766*
t-statistics	*(-1.32)*	*(1.55)*	*(0.47)*	*(0.45)*	*(-0.42)*
$CURRATIO$	*-0.0002*	*-0.0003*	*-0.2237*	*-1.1503*	*18.5124*
t-statistics	*(-0.09)*	*(-0.31)*	*(-0.51)*	*(-1.18)*	*(1.26)*
$\Delta ADMCOSTS$	*-0.0017*	*-0.0102*	*-0.0763*	*-0.3457*	*20.4746*
t-statistics	*(-1.24)*	*(-1.69)*	*(-0.32)*	*(-0.65)*	*(2.58)*

4.3.3. Impulse – response analysis for Alitalia. In order to analyze the relationship between the variables as a result of the VAR model estimation, the impulse response graphs and their periodic values are as follow:

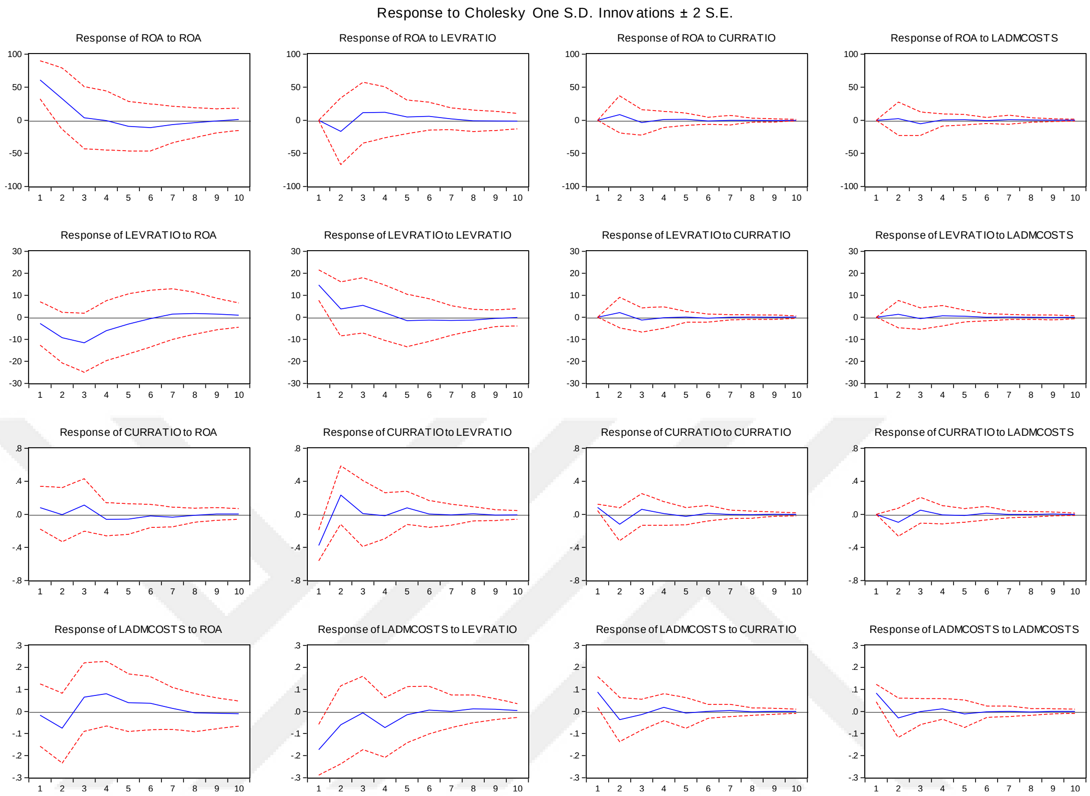


Figure 25. Impulse – Response for Alitalia

Tabulated values of action – response function graphs are as follow.

Table 27. Impulse – Response to Cholesky for Alitalia Airlines

Response of ROA:				
Period	***ROA***	***LEVRATIO***	***CURRATIO***	***ΔADMCOSTS***
2	*32.687*	*-16.733*	*-8.5846*	*2.3206*
5	*-9.1122*	*4.9373*	*1.4540*	*0.7018*
10	*1.1364*	*-1.5280*	*-0.0129*	*0.1324*
Response of LEVRATIO:	***ROA***	***LEVRATIO***	***CURRATIO***	***ΔADMCOSTS***
Period				
1	*-2.8184*	*14.6392*	*0.0000*	*0.0000*
5	*-3.0582*	*-1.5083*	*0.1433*	*0.5167*
10	*0.9641*	*-0.0852*	*0.0529*	*-0.0478*
Response of CURRATIO:	***ROA***	***LEVRATIO***	***CURRATIO***	***ΔADMCOSTS***
Period				
1	*0.0802*	*-0.3757*	*0.0831*	*0.0000*
5	*-0.0575*	*0.0772*	*-0.0233*	*-0.0143*
10	*0.0041*	*-0.0074*	*-0.0007*	*-0.0007*
Response of ΔADMCOSTS:	***ROA***	***LEVRATIO***	***CURRATIO***	***ΔADMCOSTS***
Period				
1	*-0.0165*	*-0.1734*	*0.0886*	*0.0837*
5	*0.0398*	*-0.0149*	*-0.0072*	*-0.0106*
10	*-0.0104*	*0.0040*	*0.0005*	*0.0007*

In impulse-response functions, a standard deviation given to the relevant variable on the vertical axis is the direction and magnitude of the impact of the shock on the other variable, and the period (period) is on the horizontal axis. The dashed lines represent 2 standard deviation confidence intervals.

When the second graph in line 1st is examined, when a ±1 shock occurred in the leverage ratio, the ROA series gave a very negative reaction in the first periods. It has given the highest negative reaction in the second period (-16.73), that is, in the short term. It is concluded that there is a negative relationship between the leverage ratio and ROA in both the long and short run, since it remains below the old period balance in the long run.

When the third graph in line 1st is examined, when ±1 shock occurs at the current rate, the ROA series gives a highly positive response in the first periods. When the periods are examined, it is seen that there are negative and positive reactions and they continue in a fluctuating way. This shows that the direction of the reaction differs in Alitalia as in Lufthansa, and although its effect decreases in the long term, it reaches the old period equilibrium.

Finally, when the 1st line and fourth chart are examined, when ±1 shock occurs in administrative expenses, ROA series reacts negatively in the third period (-5.24), that is, in the short term; In the long term, although its effect decreases, it shows a positive reaction.

4.3.4. Variance decompositionfor Alitalia. After the period of variance decomposition analysis, the percentage change of a variable against a shock in another variable can be examined. Variance decomposition analysis graphics and values are as follow, respectively.

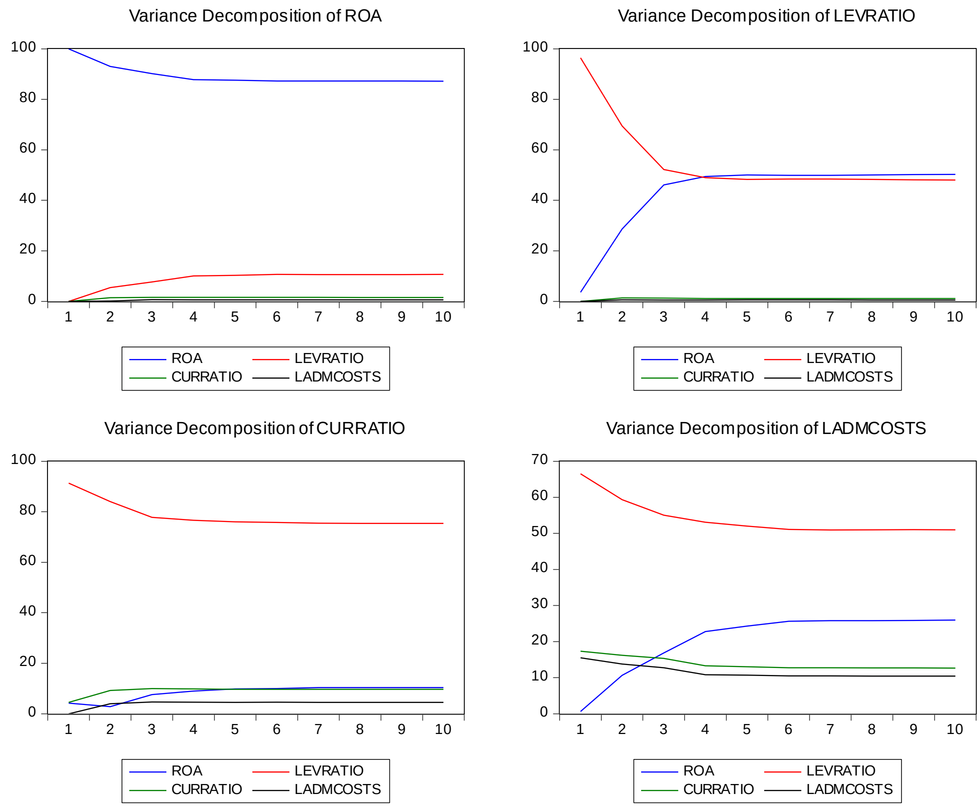


Figure 26. Variance Decomposition for Alitalia

Table 28. Variance Decomposition Values for Alitalia Airlines

Variance Decomposition of ROA	ROA	LEVRATIO	CURRATIO	ΔADMCOSTS
1	100.000	0.0000	0.0000	0.0000
5	87.5501	10.2695	1.5792	0.6011
10	87.2078	10.6614	1.5383	0.5924
Variance Decomposition of LEVRATIO	**ROA**	**LEVRATIO**	**CURRATIO**	**ΔADMCOSTS**
1	3.5742	96.4257	0.0000	0.0000
5	50.0436	48.2879	1.1210	0.5474
10	50.2909	48.0499	1.1208	0.5382
Variance Decomposition of CURRATIO	**ROA**	**LEVRATIO**	**CURRATIO**	**ΔADMCOSTS**
1	4.1647	91.3641	4.4711	0.0000
5	9.8486	75.9883	9.6570	4.5060
10	10.3999	75.4147	9.6455	4.5397
Variance Decomposition of Δ ADMCOSTS	**ROA**	**LEVRATIO**	**CURRATIO**	**ΔADMCOSTS**
1	0.6071	66.5403	17.3577	15.4947
5	24.2903	52.0107	12.9980	10.7009
10	25.9436	50.9634	12.6728	10.4201

According to the variance decomposition result, ROA, that is, the return on assets of the company, is mostly affected by its own lagged values. This result shows that the company has a negative or positive sustainability in terms of return on assets. It has been determined that any shock to the leverage ratio has a 10% effect on ROA in the long run and it is the variable that explains the shock in ROA the most compared to other variables. When analyzed for Alitalia, it is seen that the effect of current ratio and administrative expenses in explaining shocks in ROA is much more than the ratio of variables explaining ROA shocks in Lufthansa, and this result of Alitalia is similar to the result of Turkish Airlines.

As a result, the evaluations of the Alitalia airline company within the scope of the developing country are as follow; ROA, that is, the return on assets of the company, gives the biggest negative reaction to the leverage ratio compared to other variables, and an opposite relationship has been found between them. While the leverage ratio and current ratio have a negative relationship with the return on assets of the company, they have a positive relationship with administrative expenses.

4.4. The Relationship Between Macro Economic Indicators of Lufthansa and Turkish Airlines

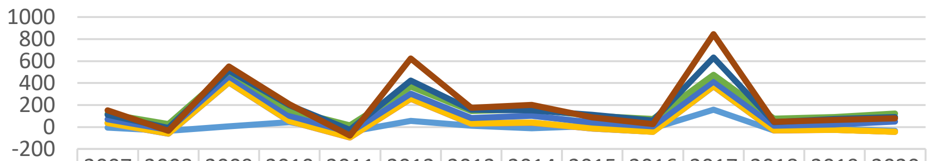
Economics is divided into two sections: microeconomics and macroeconomics. In microeconomics, derived from the Greek word "micros", reflection on the general economic issue and efficiency is essential. With microeconomics, the behavior of the individual and the firm is mostly examined, but at the same time, the basis of a solid macroeconomic analysis structure is formed. In this respect, it is important to understand microeconomics and its Fundamentals (Lesser and Page, 2013). Microeconomics is looks at individuals and business decisions. Microeconomics is considered a fundamental field for all economics. Getting an idea of microeconomics actually gives you an idea of how economies work while macroeconomics the study of the decisions of countries and governments. Though these two catagories of economics appear different, they are actually interdependent and complement one another. Many overlapping issues exist between the two fields (Investopedia, 2022).

Macroeconomics is a branch of economics that studies the workings of general economies, such as the market or other systems operating on a large scale. Macroeconomics studies events throughout the economy, such as inflation, price levels, economic growth rate, changes in national income, gross domestic product, and unemployment (Investopedia, 2022).

In this study, the data of Germany, Italy and Turkey between the years 2007-2020 were analyzed with the macroeconomic data of growth, population, unemployment, inflation, imports and exports from EUROSTAT. The European Statistical Office, or Eurostat for short, is a head office of the European Commission, headquartered in Luxembourg. Eurostat aims to provide statistics to the European

Union through its European-wide surveys. The Institution informs the European Union institutions, national administrations and the public the statistical information obtained in the European Union member countries, candidate countries and European Free Trade Union member countries through the Eurobarometer.

Italy was not included in the economic evaluation between countries due to insufficient data on Alitalia.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
M.K.	40,98	-27,1	40	8,27	-52,9	202,1	18,31	49,53	-23,3	-32,2	213,2	2,68	-10,2	-10,7
M.LF	-6,62	-34,7	5,06	44,3	-42,3	55,04	11,45	-10,3	8,93	-12,3	156,9	-33,3	-16,7	-34,1
K.TK	48,95	51,9	46,83	53,09	64,21	61,67	62,46	60,12	61,24	66,82	62,91	64,09	66,08	75,62
K.LF	32,81	34,47	52,52	46,36	44,46	45,47	51,14	60,43	52,42	48,15	41,58	41,26	49,49	91,73
C.TK	1,3	1,6	1,44	1,37	1,03	0,86	0,68	0,77	0,81	0,8	0,85	0,87	0,8	0,65
C.LF	1,05	0,87	0,99	1,05	0,97	1,09	0,88	0,75	0,72	0,93	0,87	0,66	0,71	0,68
R.TK	40,98	-27,1	400	8,27	-52,9	202,1	18,31	49,53	-23,3	-32,2	213,2	2,68	-10,2	-10,7
R.LF	-6,62	-34,7	5,14	44,3	-42,3	55,04	11,45	-10,3	8,93	-12,3	156,9	-33,3	-16,7	-34,1

R.LF R.TK C.LF C.TK K.LF K.TK M.LF M.K.

Figure 27. Microeconomic Indicators for Lufthansa and Turkish Airlines

4.4.1. Growth indicator. When evaluated interms of ROA, it is seen that there is a high level of correlation between profitability rates of TK and economic growth. However, it is noteworthy that this relationship is inverse, that is, the increase in profitability during growth and contraction periods. Here, it is understood that cargo transportation has a compensatory effect on profitability rather than passenger transportation. In LF, on the other hand, it is seen that the growth-profitability relationship is at a lower level. Accordingly, a positive relationship is observed in the years 2010-2017.

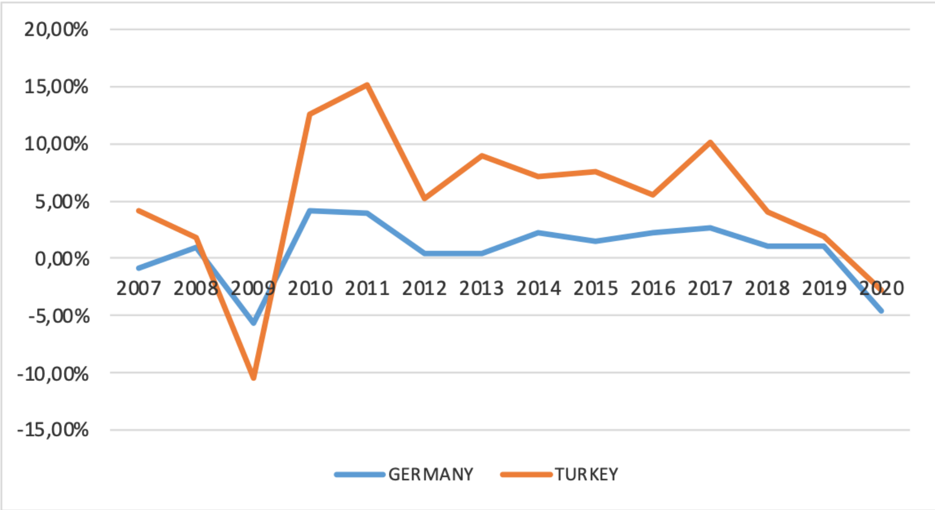


Figure 28. Groth Indicator

The datas are evaluated in terms of current ratio, there is no significant relationship between the growth of both TK and LF and liquidity. The datas are evaluated in terms of leverage, it is seen that this function does not work due to the growth in which the indebtedness ratios of both TK and LF continue to increase steadily every year. Management expenses moved positively in both LF and TK during the growth period. The growth process is a result of the share of the business executive activity in the management expenses.

4.4.2. Population indicator. When the unemployment indicator is evaluated in terms of ROA, there is no significant relationship between population growth macro indicator profitability data for both TK and LF.

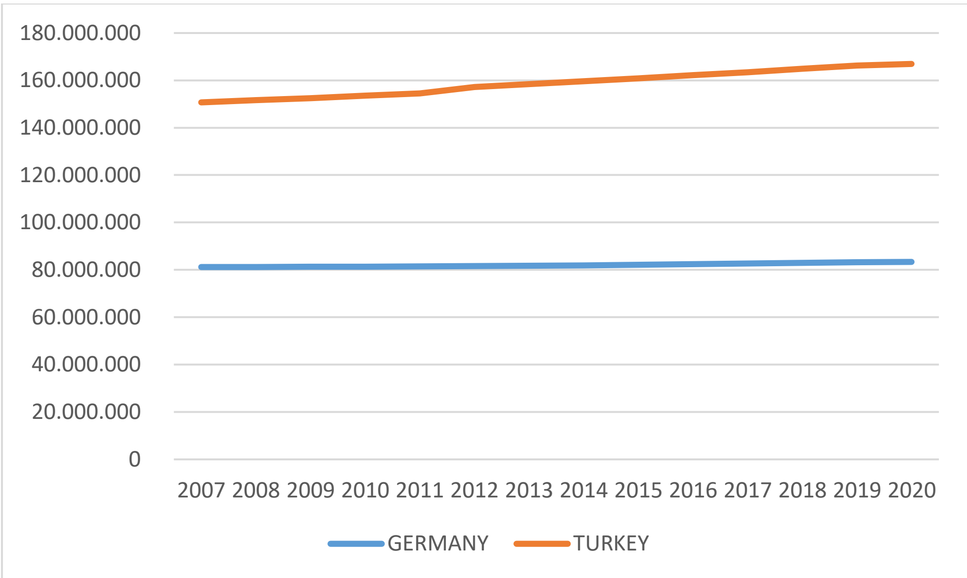


Figure 29. Population Indicator

The datas are evaluated in terms of current ratio, there is no significant relationship with the population growth macro indicator and liquidity data.The datas are evaluated in terms of leverage, debt data does not have a significant relationship with the population growth macro indicator data. Also, there is no significant relationship with the population data with administrative expenses.

4.4.3. Unemployment indicator. When the unemployment indicator is evaluated in terms of ROA, there is no significant relationship between unemployment indicator profitability data for both TK and LF

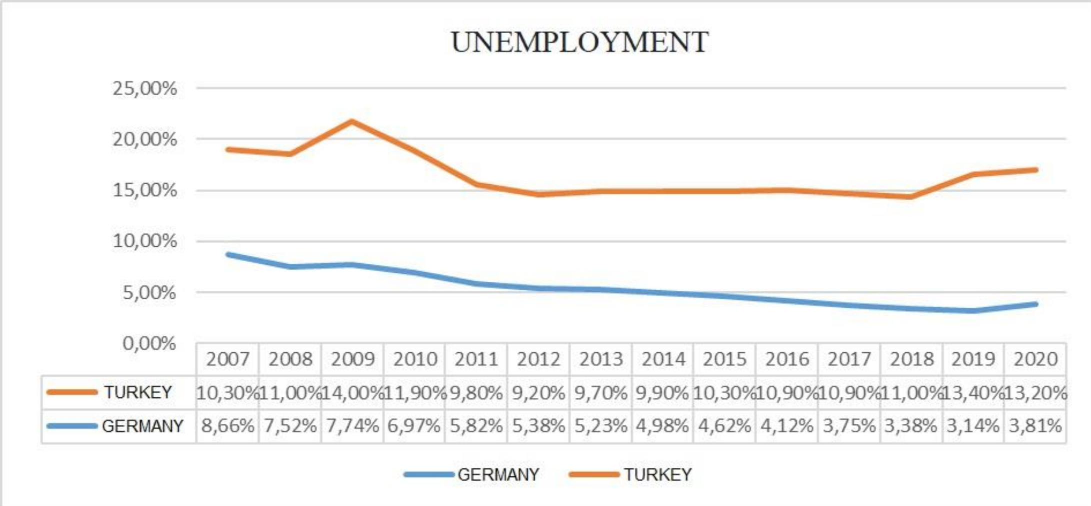


Figure 30. Unemployment Indicator

The datas are evaluated in terms of current rati, thers is no significant relationship between the liquidity data and the unemployment macro indicator. Debt data does not have a significant relationship with unemployment data, which is a macro indicator.It is seen that the unemployment indicator does not have a significant relationship with administrative expenses.

4.4.4. Inflation. When we compare the inflation indicator with the data of TK and LF, we see the effects of inflation in the data of TK, while there is no sensitivity in the data of LF. We see the sensitivity of TK to inflation, especially in profitability ratios. It is understood that the peak inflation in 208-2011-2018 caused a decrease in profitability.

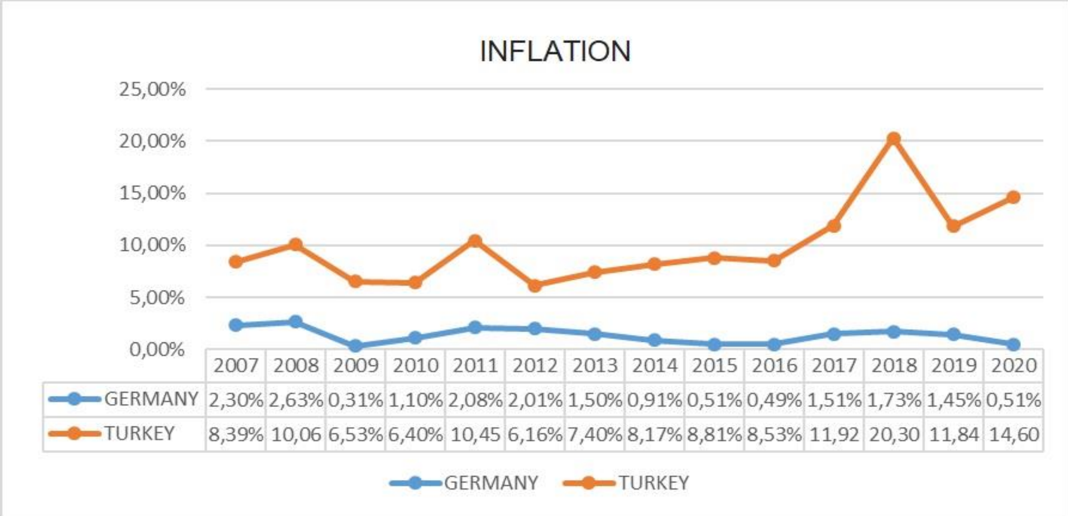


Figure 31. Inflation Indicator

In LF, on the other hand, it is observed that the inflation-profitability relationship remains at a lower level. Especially in 2011 and 2018, there is a decrease in the rate of increase in inflation and profitability. However, the stability of inflation rates in the analyzed period also reduces the effect level. Loss in 2018, 2019, 2020 is also seen as the effect of a general recession on the economy.

There is a correlation between inflation and liquidity, especially in TK. It is observed that the current ratio of TK increases during periods of high inflation and its liquidity increases due to inflation. It is also determined that the increase in Turkish Lira's weighted foreign currency incomes due to inflation also has an effect on this issue. This level of interaction is not observed in LF.

In debt ratios, it is seen that both TK and LF have grown in parallel with the inflation data. It is seen that there is a strong relationship between inflation and administrative expenses in TK. Expenses increase during peak inflation periods. The low level of inflation and education in Germany showed that administrative expenses had a low impact.

4.4.5. Export. Another important data from Macro Economic Indicators is Export. When the period is examined in this regard, it is seen that exports are effective in ROA ratio especially in both LF and TK, and the increase in exports in the general economy is effective in the increase in ROA of Airline companies. However, the relationship between TK's export growth and profitability ratio works inversely. What is effective here is the relationship between Turkey's increase in exports and the depreciation of Turkish Lira. The depreciation of Turkish Lira also caused a decrease in the profitability of TK due to the increase in foreign exchange losses.

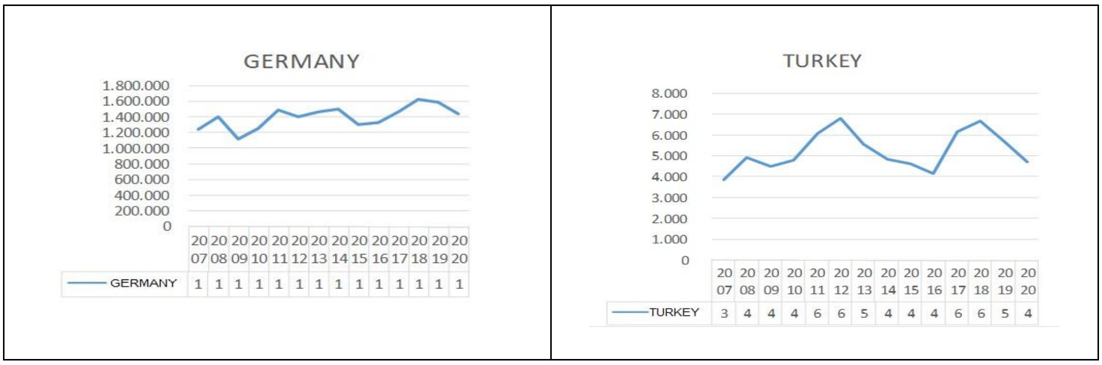


Figure 32. Export Indicator

In LF, on the other hand, although the reverse relationship between similar export profitability ratios was experienced until 2018, it was seen that the profitability decreased with the decrease in exports by having a positive relationship as of this year.It is seen that there is no significant relationship between C.TK and C.LF and K.LF and K.TK in the ratios of Leverage and Management Expenses and Liquidity (CURRENT).

4.4.6. Import. When import data are examined about ROA, it is seen that these are the indicators that companies are most affected by. Accordingly, it is seen that there is a significant relationship between the increase in TK in 2009, 2012 and 2017 and the increase in imports. In short, the increase in imports is effective in the profitability of TK. The evaluation here takes into account the effect of cargo revenues. The import effect of the profitability figures of LF, on the other hand, has a similar effect, but the effect level is seen to be lower. We see that imports affect the profitability of the aviation sector in terms of transportation.

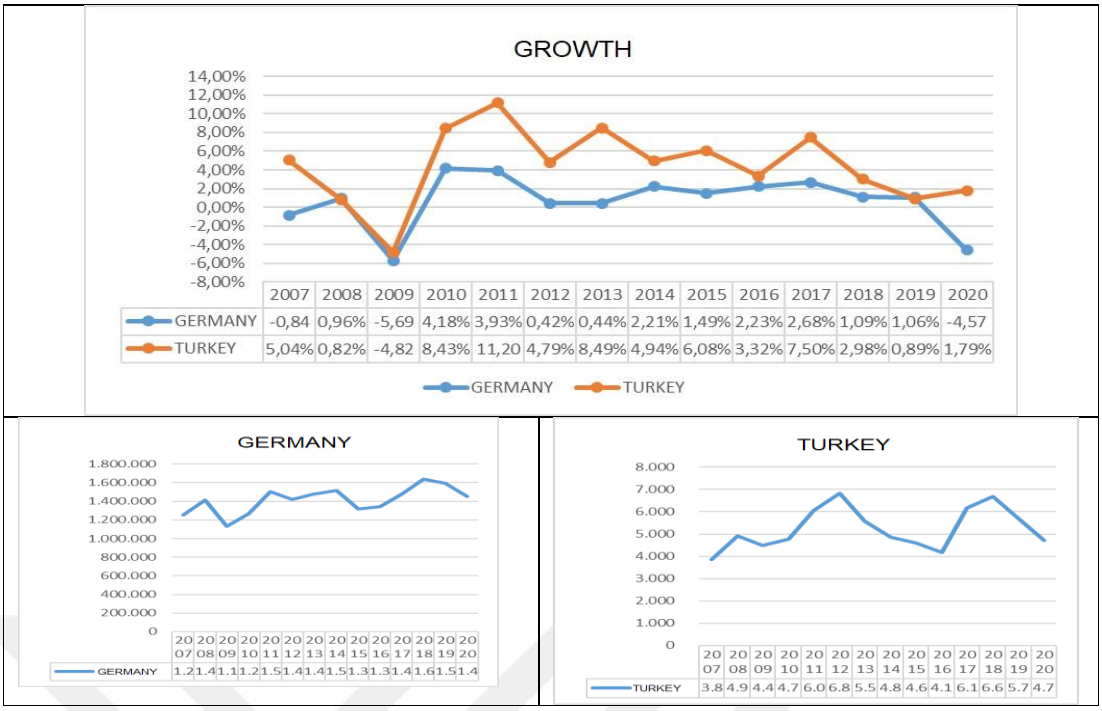


Figure 33. Import Indicator

There is no significant relationship between import and Current Ratio for TK and LH. It is even considered to have no effect. It is understood that a variable of liquidity need is not imports. Leverage Ratio for TK and LF does not seem to interact with imports. It is seen that there is no significant relationship between Management Expenses and Import for TK and LF.

Chapter 5

Conclusion

The return on assets ratio (ROA), which is mathematically represented as (Net Profit/Total Assets) x100, is used as an expression of how effectively the company's assets are used in profit generation. Return on assets ratio (ROA) shows how effectively the company's assets are used to generate profits and tells us the return on investment capital. The higher the return on assets ratio, the more money the company makes with less investment. The greater the value obtained as a result of the said calculation, the higher the potential of the company to generate profit with its assets. A negative score indicates that the company's assets are insufficient to pay short-term debts, and therefore the profitability ratio will progress negatively. (The negative relationship between ROA and current ratio, which shows the ability of firms to pay their short-term debts., This shows how much current assets the firm has allocated for its short-term debts, and as this ratio increases, it is negative on profitability.)

The leverage ratio, which is one of the financial structure ratios, expresses how much of the firm's assets are financed with foreign resources. A higher leverage ratio also indicates that the company has higher financial risk. Over 70% leverage is in the risk group. A high leverage ratio, that is, an increase in borrowing, affects profitability positively as it reduces the cost of capital, but after a certain point, it can increase the costs and has a negative effect as it will increase the risk of bankruptcy. The relationship between financial structure and profitability is discussed especially in capital structure theories. In the traditional approach, the partners of the firm increase their expectations, thus the cost of equity of the firm, with the increase in the debt level in the capital structure. Similarly, those who provide loans to the company see the company as more risky due to the increase in the debt level and increase the loan costs. The current ratio is one of the liquidity ratios of the enterprises and shows the extent to which they can pay their short-term liabilities with their current assets.

Vector autoregressive (VAR) analysis results can be summarized as follow: First of all, when the impulse response analysis findings are evaluated, when a ±1 shock occurred in the leverage ratio, ROA series has given a negative response for Turkish Airlines both in the short term and in the long term. For Lufthansa, on the other hand, it has reacted negatively in the short term and negatively in the long term, although the effect is less. When a ±1 shock has occurred in the leverage ratio in Alitalia, ROA has reacted negatively in the long and short term as in other companies. Here, when it is evaluated on the basis of impulse response between leverage ratio and ROA in general, Turkish Airlines and Alitalia ROA have given a higher reverse response to ±1 shock in leverage ratio in the short and long term compared to Lufthansa.

There are impulse response analysis findings between the current ratio and ROA, which is another factor. When ±1 shock has occurred at the current rate, ROA series has given a positive response in the short term and a negative response in the long term for Turkish Airlines. Lufthansa, on the other hand, it has reacted positively in the first periods, but in the following periods, it has given negative and positive fluctuating reactions with different directions and high volatility. In the long term, the effect is negligible and it returns to the old period balance. When the analysis result for Alitalia is examined, when ±1 shock has occurred in the current ratio, ROA has reacted positively in the first period, similar to Lufthansa and has given fluctuating responses in different directions in the middle periods. In the long term, it has remained in the balance of the old period, as in Lufthansa, and its effect has decreased.

Finally, the results of the impulse response analysis between administrative expenses and ROA have been examined. When a ±1 shock has occurred in the management expenses, the ROA of the company has given a high level of negative reaction in the short term and a positive response in the long term for Turkish Airlines. When the findings for Lufthansa have been examined, when a ±1 shock occurs in administrative expenses, ROA reacts less than Turkish Airlines and Alitalia, but it has a negative response in the short term and a positive response in the long term. For Alitalia, on the other hand, when a shock of ±1 has occurred in management expenses, ROA has reacted negatively in the short term and positively, although not as high as Turkish Airlines in the long term.

For businesses, the cost of borrowing is the interest and the cost of equity is an alternative cost. Alternative cost refers to the return that can be obtained if the capital allocated to the business as equity is utilized in alternative investments (stocks, bonds, time deposits, real estate, etc.), and the cost of borrowing is always lower than the cost of equity. Because interest, which is a borrowing expense, is recorded as an expense in the operating records, which reduces the net profit of the business a decrease in net profit leads to a decrease in the tax paid, and a decrease in the tax paid leads to an increase in the profitability per share. The positive effect of outsourcing on profitability in this way is called the financial leverage effect. Leverage is possible as long as the cost of liabilities is less than the cost of equity and ends at the point where the cost of liabilities equals the cost of equity. The reason for this is the increase in business risk due to high borrowing and, accordingly, the increase in the interest rate of new loans. The inverse relationship between leverage ratio and return on assets ratio for all 3 companies may be due to the reversal of the leverage effect due to high borrowing. The research findings obtained are compatible with the study of Taysı (2020), Demirci (2017), and Doğan and Topal (2016).

The effect of the current ratio and administrative expenses in explaining the shocks in ROA is much greater in Turkish Airlines and Alitalia, respectively; In

Lufthansa, on the other hand, it is seen that the effect of the current ratio and administrative expenses is negligible. The current ratio is one of the liquidity ratios of the enterprises and shows the extent to which they can pay their short-term liabilities with their current assets. In the literature, there is a negative relationship between the current ratio, which expresses this liquidity level and ROA in some studies, while positive relationships are found in others.

The current ratio, one of the liquidity ratios, reflects the general liquidity situation of the enterprise and reveals whether the net working capital of the enterprise is sufficient. Working capital management can affect the profitability, risk and value of the business. Under-investing in non-current assets, in other words, tying less resources and financing these resources mainly with less costly short-term foreign resources causes the firm's liquidity to decrease and profitable investment opportunities to be missed. In this direction, the result of a positive reaction in all three companies in the short term indicates that a positive development in the current ratio of the companies will cause a positive change in the return on assets of the company.

Administrative expenses are among the indicators related to productivity in enterprises. The fact that there is a negative relationship between management expenses and profitability, the increase in the expenses of the enterprise cannot be reflected in its profitability. The positive relationship indicates that the increase in expenses is reflected in the profitability. Since it is included in the expense item in the short term, administrative expenses have a negative effect on the company's return on assets at the beginning for all three airline companies. However, ROA's response to administrative expenses for Turkish Airlines and Alitalia in the long run have been positive, and it is concluded that the increase in expenses reflects on profitability in the long run.

In this study, Turkish Airlines, which is the Turkish Airline company within the scope of the developing country group, and Lufthansa, the German airline company within the developed country group, have been evaluated. Alitalia, an Italian airline company, has been considered as the control unit. While the relationship between Alitalia's return on assets and its current ratio is similar to that of Lufthansa, which is a developed country group; It has been determined that it has a similar relationship with Turkish Airlines company from the example of the developing country group in terms of management expenses. It turns out that Alitalia can be evaluated on a subject-based basis within the scope of both country groups.

Turkish Airlines (TK) and Lufthansa (LF) were chosen as scales in this study, which was conducted to reveal the relationship between the performance of airline companies, which are the most important branch of the transportation sector, and macroeconomic indicators. Three basic indicators have been chosen to measure the performance of our airline companies on a micro scale. In these data, ROA (Profitability), Current (Liquidity, Cash) and Leverage (Debt) ratios were followed.

When the relations between the micro indicators of TK and LF and each macro indicator are examined between 2007 and 2020.

- We see that both TK and LF are related to economic growth and all micro indicators. It is seen that the growth is a result of both passenger and cargo transportation in the aviation sector. TK and LF are also observed in this development. Accordingly, when economies grow, there is also a growth in air transport. This development is seen more especially in TK.
- Although there is no significant relationship between population growth and micro indicators of TK and LF, there is a significant relationship between the turnover increase of firms.
- There is no significant relationship between unemployment rates and micro indicators of firms.
- It appears as the macro value that has the highest impact on inflation rates and micro indicators of both TK and LF. It is especially seen in Current and ROA data of TK. In LF, on the other hand, this effect is seen at a low level of ROA due to the stability in inflation rates.
- In the export rate, it is seen that it is especially effective in the ROA of TK. We do not see this effect at the same intensity in liquidity and debt ratios. In LF, on the other hand, while the increase in exports does not create sensitivity, the decrease in exports shows the decrease in profitability.
- In terms of import values, it is seen that their profitability increased in the years when TK was the highest import, and the liquidity and indebtedness ratios were not in a significant relationship. In LF, this interaction is weaker and there is no significant connection.

- Administrative expenses have a significant positive relationship in Inflation and Growth Macro indicators. No interaction with other macroeconomic indicators was found.
- In all these macroeconomic indicators, it is seen that Growth and Inflation are effective in both TK and LF, especially in profitability (ROA), but in low levels of leverage and liquidity.

As a continuation of this study, Turkish Airline, Lufthansa and Alitalia can be handled separately and their volatility can be examined with ARCH (Autoregressive Conditionally Heteroscedastic) / EGARCH (Exponential Generalized Autoregressive Conditional Heteroscedastic) models and a detailed analysis of the asymmetric effect can be made with their own historical data.

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