IBN HALDUN UNIVERSITY
SCHOOL OF GRADUATE STUDIES
DEPARTMENT OF AIR TRANSPORT MANAGEMENT

MASTER THESIS

AIRLINE PASSENGERS' PERCEPTION OF SUSTAINABILITY PRACTICES AND BUSINESS MODEL OF AIRLINES: A STUDY IN THE TURKISH CIVIL AVIATION MARKET

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THESIS SUPERVISOR

ASSOC. PROF. ALİ OSMAN KUŞAKCI

ISTANBUL, 2022

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by

ALİ TİPİ

A thesis submitted to the School of Graduate Studies in partial fulfillment of the requirements for the degree of Master of Science in Air Transport Management

THESIS SUPERVISOR

ASSOC. PROF. ALİ OSMAN KUŞAKCI

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APPROVAL PAGE

This is to certify that we have read this thesis and that, in our opinion, it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science in Air Transport Management.

Thesis Jury Members

Title - Name Surname	Opinion	Signature
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This is to confirm that this thesis complies with all the standards set by the School of Graduate Studies of Ibn Haldun University.

Date of Submission Seal/Signature

ACADEMIC HONESTY ATTESTATION

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name Surname:

Signature:

ÖZ

HAVAYOLU YOLCULARININ HAVAYOLLARININ SÜRDÜRÜLEBİLİRLİK UYGULAMALARI VE İŞ MODELLERİ ÜZERİNE ALGISI: TÜRK SİVİL HAVACILIK PAZARINDA BİR ÇALIŞMA

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Dünyamızın geleceği düşünüldüğünde, sürdürülebilirliğin en öncelikli konu olarak değerlendirilmesi gerektiği artık tüm paydaşlar tarafından kabul edilmektedir. Havacılıkta sürdürülebilirlik ile ilgili literatürü incelediğimizde, konuyla ilgili bazı araştırmalar yapılmış olmasına rağmen özellikle Türk sivil havacılığı ile ilgili çok fazla çalışmanın olmadığı görülmektedir. Türk sivil havacılığının son dönemdeki hızlı yükselişi de göz önüne alındığında, sürdürülebilirlik konusunun dikkatli bir şekilde ele alınması ve gerekli araç ve politikaların geliştirilmesi gerektiği muhakkaktır. Bu bağlamda çalışmanın temel amacı, havayolu yolcuları açısından havayollarının çevresel uygulamalarının önemini belirlemek, havayollarının sürdürülebilirlik uygulamaları ve çevrenin korunmasına yönelik girişimlerine yönelik algı ve farkındalıklarını araştırmaktır. Öte yandan çalışma, havayollarının iş modeli tercihleri, yolcuların havayollarının sürdürülebilirlik politikalarına ilişkin algıları ve farkındalıkları ile yolcuların bu faaliyetlere gönüllü katkı sağlama istekleri arasındaki olası ilişkiyi ortaya koymayı da amaçlamaktadır.

Araştırmanın sonucunda, yolcuların havayollarının sürdürülebilirlik faaliyetleri hakkındaki algısının, yolcuların gönüllü olarak bu faaliyetlere katkı sağlama istekleri üzerinde önemli bir pozitif etkiye sahip olduğu tespit edilmiştir. Ancak yolcu

profilinin, diğer bir deyişle yolcuların havayolu iş modeli tercihlerinin, yolcuların sürdürülebilirlik uygulamalarına ilişkin algıları ve bu uygulamalara gönüllü katkıları arasında düzenleyici (moderation) bir rolünün olmadığı görülmüştür.

Anahtar Kelimeler: Düşük Maliyetli, Havacılık, Ödeme İsteği, Sürdürülebilirlik Algısı, Tam Hizmet, Yolcu Profili

ABSTRACT

AIRLINE PASSENGERS' PERCEPTION OF SUSTAINABILITY PRACTICES AND BUSINESS MODEL OF AIRLINES:
A STUDY IN THE TURKISH CIVIL AVIATION MARKET

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Considering the future of our world, it is now widely accepted by all stakeholders that sustainability should be put as the first priority. Reviewing the literature on sustainability in aviation, we observe that there are not many studies particularly on Turkish civil aviation although some research has been done on the subject. As Turkish civil aviation has been growing rapidly in the recent period, it is certain that the issue of sustainability should be addressed with great attention, and the necessary tools and policies should be developed. In this regard, the focal purpose of this study is to determine the importance of environmental practices of airlines from the airline passengers' perspective and to investigate their perception and awareness of sustainability practices and environmental initiatives of airlines. On the other hand, the study also aims at revealing the possible relationship between airlines' business model preferences, passengers' perceptions and awareness on airlines' sustainability policies, and passengers' willingness to voluntarily contribute to these activities.

As a result of the analysis, we observed that the perception of passengers on airlines' activities on the sustainability has a significant positive effect on the passengers' willingness to voluntarily contribute to these activities. However, the study revealed that the passenger profile, in other words, the airline business model preferences of the passengers, has no significant moderation effect between the perceptions of the

passengers regarding sustainability practices and their voluntary contribution to these activities.

Keywords: Aviation, Full-Service, Low-Cost, Passenger Profile, Sustainability Perception, Willingness to Pay

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CHAPTER I

INTRODUCTION

1.1. Scope of the Study

In recent decades, while companies continue their production activities, green and environmentally friendly practices have become a dominant trend. Reports and regulations conducted by international organizations are also increasingly written in this regard. EU Eco-Management and Audit Scheme (EMAS) and International Standard Organization (ISO) 14001 are two examples of these reports and regulations of international institutions (Hagmann et al., 2015).

International Institutions such as the UN, OECD, EU, IPCC, and international civil aviation actors, for instance, ICAO, IATA, ATAG, and EUROCONTROL, put sustainability at the top of their priority lists. Additionally, airline associations, airports, ATCs/ATMs, and non-governmental organizations have made a significant contribution by publishing reports and analyses of sustainability-related practices in aviation.

Although the considerable study has been done on the subject, our review of the literature on aviation sustainability revealed that there have been few studies, particularly on Turkish civil aviation. First of all, we aim to measure the awareness and perception of the passengers in the Turkish civil aviation market of sustainability-related matters. Additionally, we will test whether there is a significant relationship between this perception and airline business model preferences and passengers' voluntary contribution to the environmental activities which the study may contribute to the literature in this context.

In this study, the role and activities of these international organizations in general and particularly in civil aviation will be reviewed, and the solutions and actions they propose will be discussed.

1.2. Essence of the Topic

The essential purpose of this study is to identify the importance of environmental practices of airlines from the customers, particularly airline passengers' perspectives, and research their perception and awareness of environmental practices and Sustainability Policies of airlines. On the other hand, the study also aims to find out the possible relationship between the airline business models, the passengers' perception and awareness of airlines' Sustainability Policies, and their willingness to pay for these activities.

1.3. Objective of the Study

The study is to identify the awareness and perception of airline passengers regarding the environmental programs and policies of airlines and their effects on passengers' airline preferences. Additionally, it will measure the passengers' willingness to contribute to the environmental activities of airlines.

However, the primary outcome of the study is to identify passengers' preference for airline business models to categorize their tendency toward Full-Service Carriers (FCC) and Low-Cost Carriers (LCC) and to find out the possible correlation between the preference of airline type and airlines' sustainable activities.

The literature regarding sustainability in civil aviation revealed that there is a correlation in general. In this regard, the focal purpose of the study is to measure this perception and to create a sample in the Turkish aviation industry (Chen, 2010).

Considering the business models of airlines, we may think that as they focus on reducing costs low-cost carriers will be less concerned about environmental issues, which are seen as an additional cost. In addition, low-cost passengers who are price sensitive may also be less sensitive to environmental issues. Conversely, we may

presume that low-cost passengers care about environmental issues as much as full-service passengers.

1.4. Hypotheses of the Study

In this study, we investigate the relationship between airline passengers' perception of sustainability practices and their willingness to pay for sustainability practices of airlines as well as a possible moderation of the passenger profile on airline passengers' perception of sustainability practices and their willingness to pay for supporting sustainability practices of airlines. Accordingly, two hypotheses have been formulated and tested.

H_1: The perception of sustainability practices has a direct and positive effect on the willingness to pay for sustainability practices.

H_2: There is a moderator effect of passenger profile on the relationship between the passengers' perception of sustainability practices and their willingness to pay for sustainability practices.

CHAPTER II

AIRLINE BUSINESS MODELS

2.1. Development of Civil Aviation in the World

Aviation activities, which have been widely used only in terms of military and logistics for many years, and then transformed into a service area from which all members of society can benefit. In this regard, it is possible to say that there is a different perception of service and transportation preferences that have become different with the spread of civil aviation services in the course of the period prior to the emergence of the civil aviation sector.

Considering the managerial aspects of the issue, the point that can be regarded as a milestone for the civil aviation sector was the establishment of the ICAO in 1944 and the appointment of the civil aviation industry as the only authorized authority. ICOA became an international organization, which has the functions of regulation, management, and direction for international civil aviation activities, it also takes the primary responsibility for carrying out the necessary duties to make civil aviation a real sector. In this regard, ICAO's primary objective is to fully service the public's needs for civil aviation (Tutulmaz, 2013, p. 2).

The first steps towards the spread of civil aviation services took place in the USA in the 70s. Thereafter, competition has been considered a serious matter for the sector. Accordingly, with the liberalization movement of the sector in 1978, the competition enabled civil aviation to become a real sector. Through this process, a structure and identity have developed within the sector thanks to the training of qualified aviation employees and the advancement of technology. (Küçükonal & Koruk, p. 68).

This sectoral development created in the USA passed to Europe in the following period. The applications of these developments also began to be applied in Europe in the same and even better way that they were in the United States. While the integration

process of Europe continued in the 1990s, the European countries involved in this integration process, along with their aviation regimes, determined their own rules along with the international aviation rules. At the same time, the mergers of the airline companies densely experienced in Europe helped the sector become stronger (Cento, 2008, p. 15). At this point, we observed that the studies in Europe have been made more capable with the effect of Europe's efforts to establish political, economic, and social unity. In this way, the civil aviation industry has achieved a complete management approach in terms of implementation.

In the days when it was first presented to the daily use of society, civil aviation services did not receive support from a broad audience. It was considered an expensive adventure that would only be for specific segments of the community. However, after a period of strong competition, civil aviation has become a more affordable type of transportation, which made flying spread among different groups of the community. (Demir, 2016, p. 81). In general, the distance covered by the civil aviation industry's flight services has increased by 49% as of the beginning of the 2000s (Yazgan & Yiğit, 2013, p. 424). In terms of the preference rates for civil aviation in the 2000s shows that the passengers' ideas about transportation have changed in favor of civil aviation.

The production of new advanced aircraft in capacity and technology and the expansion of privatization and partnerships that increase competition in the sector have been the basis for the steps taken to expand interest in the civil aviation industry. In this way, while the attractiveness of aviation increases and the interests of customers are intensified, the sector has mainly become customer-oriented (Korul and Küçükönal, 2003, p.24). Thus, the civil aviation industry has become increasingly competitive as a customer-oriented sector and the primary choice, especially for developed and high-income societies.

2.2. Civil Aviation in Turkey

During the Ottoman Empire, Turkish aviation activities were first restricted to the military. The Ottoman Empire, assaulted by the Italians in the Tripoli War of 1911-1912, recognized the necessity of aviation and began its first military aviation

programs. The earliest civil aviation activities in Turkey started in 1912 with a tiny square of two hangars and amenities in Sefaköy near Ataturk Airport. The Turkish Aircraft Association, which eventually became the Turkish Aeronautical Association in 1925, created the institutional underpinnings for Turkish aviation (Korul and Küçükönal, 2003, p. 24-25).

The formation of Turkish Air Mail with a fleet of five aircraft in 1933 marked the beginning of civil air transportation. After ten years of State Administration of Property, airlines were created under the Ministry of Defense of the Republic of Turkey. In order to support the growth of aviation in Turkey, these institutions founded a civil airline company that was certified by the government. Following that, this institution served as the foundation for Turkish Airlines, which still exists now (Bolayırlı, 2000, p. 8).

In this period, private enterprises also started to be established. In 1935 Nuri Demirağ, a great Turkish aviator, established the aircraft factory in Beşiktaş, Istanbul, the aircraft and engine factory in Sivas Divrigi, the airport, and the "Sky School" in Istanbul. In the mid-1940s, the state and the private sector together became Europe's 3rd largest air industry. While the "Turkish Aeronautical Association" developed planes and engines in Kayseri and Etimesgut, Nuri Demirağ created the first Turkish-type passenger plane entirely using Turkish engineers and employees. In 1938, the Nu/D-38 passenger plane won first place in the European Class A passenger aircraft category. (Saldıraner, 1992, p. 33).

Turkey's impressive civil aviation development began after World War II. During this time, both plane modernization and the development of new airports were prioritized. The Ministry of Public Works founded the Airports Bureau in 1949. The State Airports Authority established by the law in 1956 was responsible for the operation of airports and assuring flight safety (Sezgin, 1991, p. 47).

The Civil Aviation Authority Presidency was founded in 1954 to ensure conformity with international aviation laws and to regulate and supervise civil aviation activity in Turkey. Turkish Airlines continued to operate as the country's only commercial carrier after the restructure in 1956 (Saldıraner, 1992, p. 33).

Turkish Airlines was the country's only carrier for domestic and international flights between 1958 and 1983, with a fleet of F-27, Viscount, DC-9, DC-10, B707, and B727 types of aircraft. Hava Hizmetleri AŞ and the private firm Çelebi Hava Servisi AŞ were founded in 1958 to provide ground handling and catering services to Turkish Airlines and foreign aviation operators. While Havaş was well known for its ground services, its catering segment was privatized in 1987 under the name USAŞ (Cam, 2018, p. 44).

With the entrance into force of Civil Aviation Law No. 2920 in 1983, Turkish civil aviation achieved significant growth, particularly in the second half of the 1980s. During this time, Turkish Airlines began to modernize and standardize its fleet as part of its growing strategy and aimed to increase its service standards by focusing on overseas flights, which are more cost-effective than domestic flights.

After the amendment of Civil Aviation Law No. 2920, Private airline businesses were also allowed to organize and operate in the country. Accordingly, the number of private airlines was established and then their fleet capacity and their market share increased significantly.

However, some private airlines faced numerous challenges, including a lack of working capital, the disadvantages of operating with older aircraft, insufficient maintenance and repair, and other infrastructure facilities, and difficulties obtaining qualified personnel at all levels of their operations. Furthermore, due to a lack of assistance from the sector, they became insolvent and ceased operations quickly (Korul & Küçükönal, 2003, p. 25).

Small airports, such as STOL (Short Distance Take-off and Landing), began to be built with local government contributions at the end of the 1980s. On November 19, 1986, a protocol was signed between the Military Chief of Staff and the Ministry of Transport to open military airports to civil air transport (Servantie, 2015, p. 7 -8).

The Gulf Crisis and the subsequent heated war in 1990 harmed the sector, which continued to grow until the first half of 1990. The sector had a decline in 1991, which was mostly due to the high cost of insurance and the significant increase in reservations

and flight cancellations. However in 1992, the aviation sector saw a rebound, and development continued until 1997. (DPT, 2001, p. 43).

Turkish aviation was negatively impacted by the Far East countries' economic crisis in the air transport sector in 1998. To counteract these undesirable consequences, airline companies tried to survive by rearranging their activities, removing personnel, and re-planning their fleets. During this period, the privatization of Turkish Airlines came to the agenda (Cam, 2018, p. 47).

In the 2000s, Turkish civil aviation made significant progress with the new airlines and regulations. Especially with the liberalization in the market, new airlines were established, and the capacity of international and domestic flights significantly increased.

Turkey's Civil Aviation Law, as amended in 2001, allows private companies other than Turkish Airlines to engage in civil aviation activities and these companies became free to determine fares. Regulations enacted in 2003 also increased competition on domestic routes, and service quality increased while prices decreased. The regulation passed in 2003 allowing private airlines to operate domestic flights became a breaking point in Turkish civil aviation history. After 2003, air transport enjoyed a competitive market structure, improved service quality, and reduced prices. In order to meet demand, the Turkish Airport Authority increased the passenger capacity from 55 million in 2003 to 185 million in 2012. The movement to liberalize the global market also ushered in a new era for the air transport sector. All these developments increased the level of competition. For Turkish airline companies to enter the new phase, the domestic market had to be competitive, and participation in international airline alliances was a must. Indeed, with companies other than Turkish Airlines acquiring domestic flights, competition and service quality increased and prices dropped. However, there is no particular regulation on applying competition law in the air transport sector in Turkey, unlike in the EU and the US. In the field of Turkish civil aviation liberalization process in addition to modernizing and raising the service standards of Turkish Airlines, the number of private airlines, the fleet capacity, and their share in this area increased significantly. Undoubtedly, to sustain these developments and compete in the global market, it was crucial to improve the quality

of education in the aviation sector and make new investments (Sarıbaş ve Tekiner, 2015).

The aviation and airport industries are expected to grow at an ever-faster pace in the coming decade, thanks to new developments and investments. The diversity of services and goods available in aviation has increased dramatically in recent years, partly due to the processes and rules that have been implemented. The state of civil aviation in Turkey by the end of 2016 can be summarized as follows:

- Fifty-five airports,
- 156 aviation companies, thirteen of which are airline organizations,
- 1,417 planes, including 540 airplanes, 231 air taxis, 237 balloons, 347 planes utilized in fashionable aviation companies, and sixty-two planes utilized in agricultural spraying companies,
- 29 flight (and type) schooling institutions, eighty renovation organizations,
- 191,716 personnel within the region,
- Industry turnover of 23.4 billion dollars,
- 100,365 seats and 1,821,600 kg of cargo potential,
- Seven domestic centers, fifty-five home flight factors, and 286 global flight factors overseas

Significant development has been made in airline visitors and goods transport, alongside the reality that airways are in all towns and newly opened traces each on home and global routes. As of the give up of 2016, there are thirteen airline organizations registered in Turkey for passenger and load transportation or commercial freight enterprise within the civil aviation region. The wide variety of airplanes of airline organizations has reached 540 as compared to the preceding 12 months. Five hundred fifteen of the planes are passenger planes, and 25 of them are cargo planes. The overall seat potential of the airline fleet is 100,365, and the whole shipment potential of the cargo planes is 1,821,600 kg. According to the studies of Brand Finance, a global brand valuation organization, Turkish Airlines became "the most precious brand" in Turkey in 2016. In addition, as per the Skytrax score agency, Turkish Airlines became the "Europe's Best Airline Company" for 6 consecutive years, from 2011 to 2016.

After Atatürk and Sabiha Gökçen Airports, New Istanbul Airport is Istanbul's third international airport. The new airport, expected to be the world's largest airport, will feature up to six runways and a capacity of 150 million passengers, with an expansion potential of up to 200 million. More than 350 foreign destinations will be served by 150 airlines flying out of the airport. Given Turkey's superior geographic location and the additional traffic the new airport will bring to the region, it's clear that Istanbul will be Europe's most important international aviation hub. This forecast is a significant motivator for Turkish Airlines and other private Turkish airlines to devise strategies to expand destinations in the region so that their international networks can be fully utilized. Istanbul Airport is the largest infrastructure project in Turkey, and the airport will definitely have a considerable impact on the Turkish economy too. According to the economic impact research report, the new airport will add 4.89 percent to national income per capita after its full operation, by producing 100,000 direct and 150,000 indirect jobs. The report also presumes that it will also contribute $7 billion to the tourism industry. (Aksoy, C. and Dursun, O. 2018)

2.3. Airline Business Models

In the literature on airline business models, it is possible to encounter different classifications in different studies. Business models of airline transportation can be classified as full service, low cost, regional, charter, and commercial aviation (air taxi). (Koch, 2010, p.154). Another classification is in the form of full-service, low-cost and regional airlines. As with the classification of airline business models, there is no consensus on identifying these business models. For example, the same business model is named full-service, network, full-service network carrier, traditional, the flag carrier, or legacy in different sources (McKnight, 2010, p. 46).

In studies on the classification of commercial airlines, it is understood that different classifications and models are determined. These classifications differ from large network carriers to private jets, from charter airlines to regional airlines.

In the study conducted by Klemm et. al., a classification was established using “the business model canvas and clustering algorithms”. As a result, “seven airline business

model clusters" were created. With this model, 42 airlines have been examined, and their characteristics are indicated in Table 2.1 (Klemm et al, 2018).

Table 2.1. Results of the Cluster Analysis (Klemm et al., 2015)

Cluster	Definition	Airlines
Point-to-point low-cost carrier	Homogeneous fleet	Ryanair, easyJet, Vueling, Azul
	Low-service orientation	
	Low-operating costs	
	Point-to-point	
	Strong market position	
Hub-and-spoke low-cost carrier	Homogeneous fleet	Southwest Airlines, Cebu Pacific, Air Asia, Aer Lingus, Scoot, Jetstar
	Low-service orientation	
	Low-operating cost	
	Hub-and-spoke	
	Some long-haul flights	
Global hybrid carrier	Neither low-cost nor network carrier	Air Berlin, China Eastern, Hainan Airlines
	Hub-and-spoke and point-to-point	
	Strong competition	
	High-operating cost	
Medium-size network carrier	Solid financial market position	Turkish Airlines, Virgin Atlantic, Iberia
	Long-haul flights	
	Hub-and-spoke	
	Similar to large-size network carrier	
Global niche market network carrier	Strong market position	Finnair, TAP, Avianca, South African Airways, Air New Zealand, Aeroflot
	Hub-and-spoke	
	Serving niche market	
	Strategic geographic position	
	Low-regional competition	
High-quality network carrier	High-service level	British Airways, Emirates, Etihad, JAL, ANA, Singapore Airlines, Thai Airways, Malaysia Airlines, Korean Air
	Large aircraft	
	Low frequency	
	High-operating cost Hub operating hours up to 24 h/day	
Large-size network carrier	Heterogeneous fleet	United Airlines, Qatar, China Southern, Lufthansa, Cathay Pacific, Air China, American Airlines, Delta Airlines, Air France, Qantas, KLM
	Large-route network	
	Hub-and-spoke or multi-hub	
	High-operating cost High competition	

However, when we look at the sector and literature, it can be observed that the classification has been set up under two main groups as “Low-cost and Full-service network carrier”. Other models can be listed under these two main groups or as a mixture of these models.

2.4. Full-Service Carriers (FSC)

Legacy Carriers, National Flag Carriers, or Traditional Airlines can be seen as the definition of FSCs in the sector.

A full-service carrier is typically a traditional, national flag carrier or large airline. It has a wide flight network; hence also called a full-service network carrier. It has all the services that an airline can provide (Koch, 2010, p. 156).

Until recently, the full-service model included all the services in the ticket price, which is called "bundling the product". Increasing competition in the industry and the attractiveness of ancillary revenues revealed the need for full-service carriers to revise their business models. Full-service carrier airlines adopted the hybrid airline business model after some studies that applied cost-cutting methods to be able to continue providing the passenger with the values and services mentioned above (Çetiner, Güneş, and Peker, 2019, p.140).

Taneja (2004) states that large and traditional airlines generally do not understand the inconsistency between marketing and operational strategies. As the best example of this situation, Taneja stated that they are indeed operating as low-cost airlines with low operational performance but at high costs (Taneja, 2004).

Airline demand is affected by many factors that interact with each other. Some of these factors can be demographic factors, geographical factors, economic factors, socio-cultural factors, airline product components characteristics, airline product features, etc. Airlines have to offer their services with advanced market segmentation to meet the increasing needs of different customers. Because it is no longer possible to act with

“one size fits all” logic suitable for every customer, and the needs, wishes, and priorities of each customer group differ (Önen, 2018, p. 785).

In addition to basic products such as catering, newspapers, in-flight entertainment, internet access, etc., traditional airlines are constantly adding new products and services in order to be ahead of the competition. However, it seems that because of limitations, competitive advantages based on product differentiation will likely disappear in a short time (Toprak, 2019, p. 17).

2.5. Characteristics of FSC

In this business model, airlines offer services in more than one class (Economy, business, first class, etc.). Depending on your traveling class economy, business or first services such as the comfort of the seats, free food and beverage, and in-cabin entertainment are provided.

FSCs have services such as different seating classes, in-flight entertainment, food and drinks, keeping luggage in the cabin, waiting for lounges for distinguished passengers, and loyalty programs for frequent flyers with or without additional fees (Koch, 2010, p. 156).

Traditional airlines use computerized reservation systems as distribution channels, and most flights are still sold through travel agencies. This causes huge costs and competitive disadvantages for FSCs as they pay commissions to computerized reservation systems and travel agencies (Toprak, 2019, p. 17).

As mentioned, FSCs are also called network-to-network carriers. They usually carry passengers from one point to another, transferring through their hub, which is the Hub&Spoke model of the network.

Another marketing tool developed for traditional airlines to be competitive is frequent flyer programs. In order to keep the customer as a loyal customer, almost all airlines have established their frequent flyer programs. (Önen, 2018, p. 785).

In the FSC business model, airlines offer short, medium, and long flights with different aircraft types. They usually offer different flight options transferring passengers via a single hub called frequent scheduling and flight flexibility. They have different flight comfort options and different in-flight services for passengers, such as economic class, business class, and first class. Likewise, they also offer various types of ground services, namely lounges, priority check-in, etc. In summary, passengers have various options for different services and products according to their wishes and needs.

2.6. Low-Cost Carrier

Usually, in the low-cost carriers (LCCs) airline business model, only economy class is provided in the cabin. In order to have more seats available for sale, leg rooms of seats are adjusted as short as possible, and no free food and beverage opportunities are available. Generally, food and beverage can be purchased in the cabin by paying an additional fee, which is a huge additional income for LCCs. The World's leading airline with a low-cost business model is the US Southwest Airlines. In Europe, Irish Ryanair first implemented the model. This model focuses mainly on lowering costs as much as possible and on transporting passengers from one place to another, which is the main service of an airline (Koch, 2010, p. 157).

ICAO defines LCC as an airline that has a lower cost structure than others and demands lower ticket prices from its passengers. It may be an independent company, a part or subsidiary of a large airline, or, in some cases, an old charter part of an airline group (ICAO, 2016).

In addition, despite the common perception that passengers traveling for holiday purposes preferred low-cost airlines in the past, we observe that today business travelers also choose this type of airline. Therefore, their market share has been increasing day by day (Önen, 2018, p. 877).

2.7. Characteristics of LCC

Low-cost airlines have limited galley areas, as there is usually no free food and beverage service. Furthermore, they use secondary airports to shorten their turnaround time and extend the flight time. Instead of using the Passenger Boarding Bridges at the terminal, they prefer boarding passengers through the front and rear doors on the apron in order to reduce the cost and perform boarding faster. They like short, simple, and effective advertising and promotional messages.

They use direct distribution via the internet and fewer or no travel agencies or global ticketing systems because of lowering the commission cost (Budd and Ison, 2017, p. 111).

According to Graham and Shaw (2008), LCCs apply cost-saving methods during the flight, and they are;

- Operating mainly on short-haul flights,
- Providing no or very limited free food and beverage services,
- Serving no other opportunities such as the internet and paper media, etc.

They usually like to have non-unionized labor, a fixed and low salary given by the low-cost carriers to the cockpit and cabin crew.

LCCs usually operate point-to-point flights instead of having a Hub&Spoke network structure. They do not perform transit traffic and transfer passengers. In this way, the airline does not have any responsibility when transfer or transit passengers miss their connecting flights at the airport (Holloway, 2008, p. 33).

Their target markets include low-income traveler, students, blue-collar employees, farmers, and those who have never made a flight before (Önen, 2018, p. 786).

2.8. Additional Services and Ancillaries (Unbundling The Services)

The fundamental strategy of LCC is to unbundle airline services to passengers. They are offering the main airline service, which is transporting passengers from A to B at a price as low as possible. At the same time, they try to sell ancillary services to as many passengers as possible. It is also beneficial for passengers who do not want to pay for services they do not need. FSCs offer airline services as a package of bundled services according to their strategic choice. The passenger has to pay a package price, which may be lower than the unbundled case, where the passengers buy the entire package one by one. It may also be beneficial for passengers who prefer to utilize all the services (Inter VISTAS, 2013).

Simply LCCs are trying to increase their revenue by unbundling airline services and related products. These services can be classified as follows (Akpinar, 2019p:35):

- Seat selection (exit row etc.)
- Extra time for booking
- Change or cancel tickets at a low price or free
- Carrying excess baggage and sports equipment
- On-board catering sales
- Priority boarding right
- Inflight entertainment system
- Inflight wireless internet
- Earning or purchasing miles
- Credit card installment
- Call center communication
- Passenger lounges
- Fast lane for security, check-in, and boarding
- Frequent flyer program

Third-Party Additional Services:

- Rent a car
- Airport transfer
- Car park
- Hotel booking

- Travel insurance
- Tour organizations
- Touristic event

In 2020, CarTrawler and IdeaWorksCompany published the ancillary revenue report among 81 airlines for 2019. Ancillary revenues of these airlines were statistically enhanced to a group of 134 airlines in order to reflect a global perspective of ancillary revenue activity by the World's airlines for 2020 (see Figure 2.1) (CarTrawler and IdeaWorks 2020).

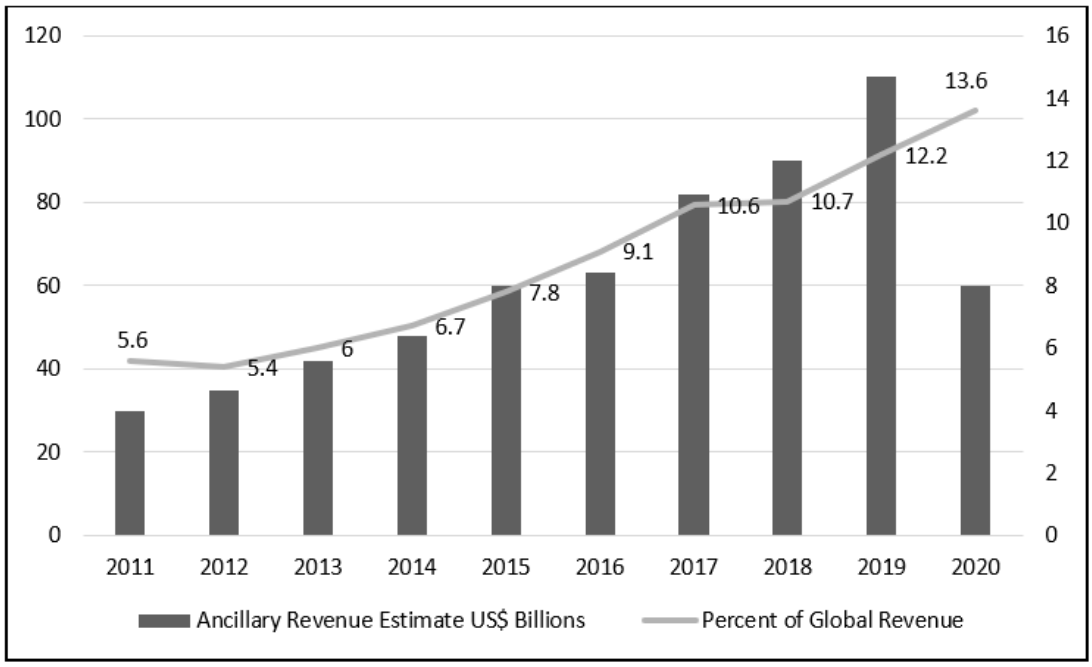

Figure 2.1. The Ancillary Revenue Report (CarTrawler and IdeaWorks, 2020)

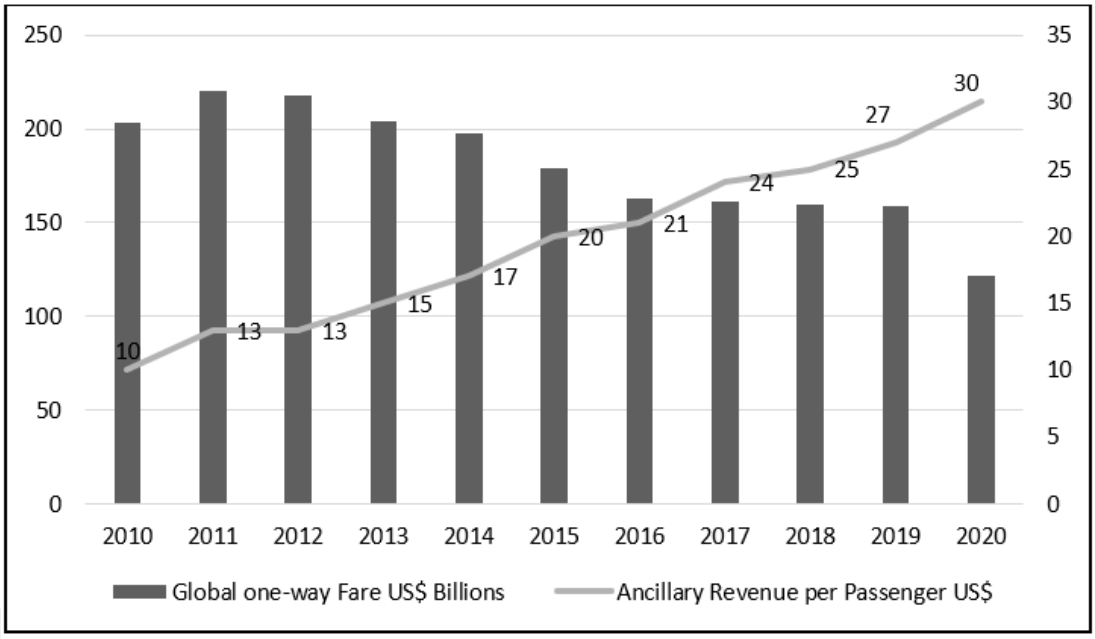

Figure 2.2. The Ancillary Revenue and Fare Comparison (CarTrawler and IdeaWorks, 2020)

Figure 2.2 shows that the ancillary revenues have constantly been increasing, while the fares have been decreasing since 2011.

According to the IATA's Global Passenger Survey in 2015, excess baggage, on-board catering, and set selection/upgrade are the most purchased additional services (see Figure 2.3). However, other ancillaries have been gaining their portion year by year (IATA, 2015).

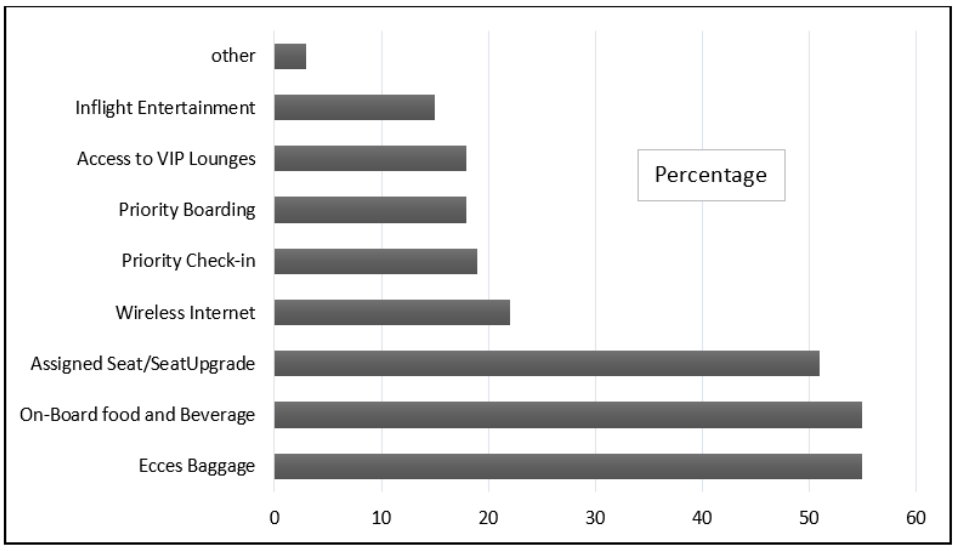

Figure 2.3. Additional Airline Services (IATA, 2015)

2.9. Comparison of FSC and LCC

FSCs mostly operate using different types of aircraft and utilizing the advantages of global distribution systems to serve all passenger market segments. They cooperate with other airlines and global alliances, aiming to increase the number of city pairs with connecting flights. FSCs with large complex network structures have wide flight networks spread over a wide geography. LCCs follow the cost leadership-based competition strategy against FSCs. They generally give up or differentiate some services in order to reduce costs and accordingly be able to offer low fares (Önen, 2018, p. 785-786). Possibly this is the most significant difference between FSC and LCC to show low one-way prices while FSC cannot react in the same way (Carmona et al, 2008. p11).

Although LCC and FSC business models largely overlap in some activities, there are fundamental differences in some areas. Both share a similar external environment and the risks exposed from this external environment. LCCs try to keep away from the adverse effects of the economic characteristics and the risks in the air transport industry by adopting different strategies and service approaches. For instance, LCCs adopt the point-to-point flight approach to avoid the disadvantages of the ball-and-distribution system (Toprak, 2019, p.28).

In summary, the differences between low-cost carriers and full-service traditional carriers can be listed as follows (Curran, 2020):

- LCCs adopt a simple product and low-price structure, while FSCs offer a complex product, price, and service structure.
- LCCs prefer secondary and cheap airports; FSCs are the main airports.
- LCCs prefer the same type of aircraft to have efficient and fast turnaround; FSCs prefer low daily flights for short distances.
- LCCs specify their strategy that all additional services and products are paid for besides the primary services. FSCs sell complex and integrated service products on the other hand.
- FSCs focus heavily on their whole service package, while LCCs develop business plans heavily dependent on ancillary revenues.

- While LCCs mostly prefer short-haul flights, short and long-haul flights have the same importance for FSCs' business strategy.

Considering the above differences, it appears that low-cost carriers are more selective, which is directly related to the financial structures and business plans of the low-cost carriers. On the other hand, FSCs' business plan appears to be more specific which creates essential credibility for traditional carriers.

Hunter's research is a praiseworthy example as a brief explanation of comparing FSCs and LCCs (Carmona et al, 2008). Tables 2.2 and 2.3 summarize the main characteristics of FSC and LCC.

Table 2.2. FSC Operation Model (Hunter, 2006)

Strategy	Differentiation
Scale	Typically large
Model	Hub and spoke/Multi hub and spoke
Operations	A mix of short, medium, and long-haul flights Different aircraft types and engines Moderate aircraft capacity utilization (60%)
Market	Different classes of service and qualities (economic class, business class, and first-class) Frequent scheduling and flight flexibility Extensive inflight services, Ground services, Main airports
Inventory Management	Travel agents, feeder routes, in-flight service, and pre-arranged tickets and seats

Table 2.3. LCC Operation Model (Hunter, 2006)

LCC Characteristics	LCC model strategies
General strategy Size	Minimization of the operation costs and cost leadership Southwest, EasyJet, and Ryan air are big but normally LCC airlines are smaller than FSC airlines
Operational mode	Point to point, no connection, short-haul (400 to 600 nautical miles) Uniform aircraft type (Boeing 737) High seat density and high capacity utilization Short turnaround time

Table 2.3. (cont.)

Market	Cheap air passenger sector market, time of booking, and choice of flight Few flexibilities to change flights No food and drinks Typically use secondary airports Some of them do outsourcing in ground service
Inventory Management	An electronic ticket or tickles, no travel agency, and internet booking or direct

2.10. Other Business Models

2.10.1. Hybrid Carriers

In response to the success of low-cost airlines, full-service carriers began to reduce ticket prices to the same level as low-cost airlines. Because of this change in ticket prices, passengers can get more services for the same price. This situation temporarily affected the market shares of low-cost airlines. Low-cost airlines trying to recover their decreasing market shares established a new business model by bringing their business models closer to full-service carriers. While the new hybrid business model offers affordable prices to passengers, additional services increased customer satisfaction (Avram, 2017, p. 150-151).

Hybrid airlines appeal to travelers who value the price and travel experience equally, with a relatively low-ticket price and enhanced service delivery value proposition. These airlines follow mixed strategies on standardization of aircraft fleet, in-flight catering, flight network, and subsidiary income. The fleet structure of hybrid airlines consists of mixed planes. While some of the fleets have the same type and in-cabin layout as in low-cost carrier airlines, some of the fleets can consist of wide-body aircraft capable of a long-haul flight. Another differentiation strategy of hybrid airlines is the mixed strategies of their flight networks. In addition to performing operations from secondary airports preferred by low-cost carrier airlines, hybrid airlines also use hub-class airports. Thus, while providing services to passengers who want to use the main airports, they expand their flight networks by making a Code Share agreement with other hybrid airlines and full-service companies in the main airports (Štimac, et al 2012, p. 6-7).

2.10.2. Airline within Airline

For various reasons, large and traditional airlines establish low-cost airlines affiliated with them. This model is called the airline in the airline business model.

Airline within airline business model is a business model that has been frequently discussed in the literature since 2005 and has reached empirical findings (Taşçı and Yalçınkaya, 2015, p. 178).

2.10.3. Regional Airlines

Regional airlines are operating in smaller region that is usually far from the main traffic flow. Today, regional airlines are increasingly integrated into the full-service airline system. This integration takes place in the form of acquisition and regional partnership (Mutlu and Sertoğlu, 2018, p. 531).

2.10.4. Charter Airlines

Charter airlines are airlines that operate non-scheduled flights. They usually carry passengers to holiday destinations as part of the tour package. Seasonal effects on flights of charter airlines are very strong (Koch, 2010, p. 161).

2.10.5. Business Aviation (Air Taxi)

Business aviation (air taxi) is carried out on demand with small jets, propeller planes, or helicopters. Air taxis provide customers with advantages such as time savings, flexibility, comfort, security, and privacy (Wensveen, 2007, p. 139).

2.11. Possible Future Trends

As a result of increased merger activity, the U.S. Airline industry has been addressed in a formal discussion of the possibility of re-regulation in recent years. The role of government increases its importance, effects, and pressure.

LLCs and FSCs are getting closer. They learn from each other and their business models. To be able to compete and survive, FSCs are also unbundling their product and services. By doing that, they aim to increase revenue. On the other hand, LCCs are trying to provide their customers with a more comfortable seamless travel experience. They have much larger network structures now. In the future, we may see a lot of LCCs operating long-haul/long-distance flights, for more than 6 hours.

In the near future, we may see fewer big carriers and many LCCs. The number of larger airlines will decrease, and consolidate each other. There will be huge mergers and acquisitions in the market. Similar to what was experienced in the US market, 2 or 3 large network carriers may maintain their operations in Europe. On the other hand, we can predict that the number of LCCs and small regional carriers will increase.

CHAPTER III

SUSTAINABILITY INITIATIVES IN AVIATION

3.1. The Concept of Sustainability and Environment

In its 2015 report, the United States Environmental Protection Agency (EPA) describes sustainability as “Everything that we need for our survival and well-being depends, either directly or indirectly, on our natural environment. To pursue sustainability is to create and maintain the conditions under which humans and nature can exist in productive harmony to support present and future generations”.

On the other hand, The Brundtland Commission gave a well-known description of sustainable development in 1987: “Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Humankind has directly interacted with the environment since its existence. He used it to increase the level of prosperity with the help of developing technology and the constantly changing environment. Continuous use of natural resources and changing the environment to increase prosperity have caused the depletion of resources, environmental degradation, and pollution that threaten the future of humanity, other living, and the future of the World. If human well-being is to be significantly improved, it is critical to ensure the sustainability of the environment and natural resources. The term "environmental sustainability" refers to maintaining the availability of natural resources in the future. Environmental sustainability includes biodiversity, air, water, and soil quality, human health, and animal and plant life. (Kaypak, 2011, p.26).

Three major aspects influence the environment and its long-term viability. Industrialization, urbanization, and high population expansion are three of them. The rapid growth of the population began in the 18th century, bringing with it

environmental issues. With the development of technology, the use of natural resources has increased. Nature, previously considered unlimited and free, has turned into a limited capital with increasing production activities in contemporary societies. The environment has been dramatically affected by exploitation, which is defined as the economic-based attacks that developed especially after the industrial revolution. From this period until the 1960s, the damage to the natural environment was seriously ignored (Yaylı, 2012, p. 159).

Within the scope of renewable resources, the level of resource usage should never exceed the level of resource regeneration for reasons of environmental and ecosystem sustainability. The essential criterion in natural capital protection is that resource stocks must be present at all times. The stock of renewable resources should not drain over time, and in the event that exhausted resources are depleted, the number of renewable resources and man-made capital should be replenished to compensate for the depleted resources. (Çetin, 2006, p. 4).

The concept of Sustainable development focuses on three pillars. Economic, social, and environmental sustainability. (Purvis, et al 2019)

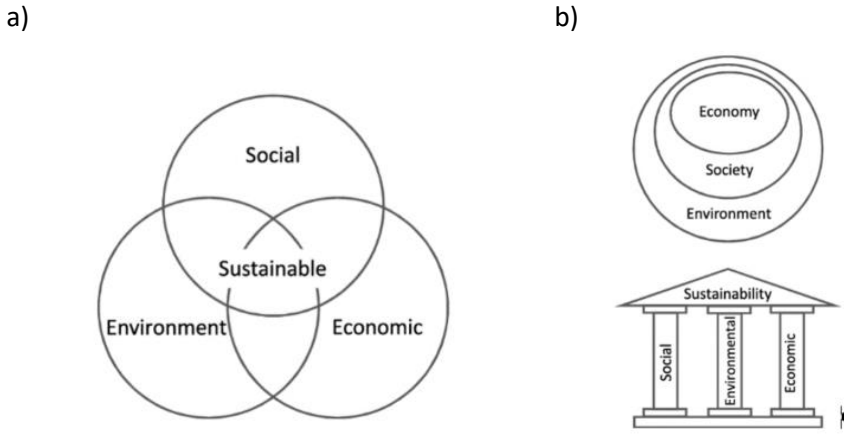

Figure 3.1. The Concept of Sustainable Development (Purvis 2019)

In Figure 3.1(a), three intersecting circles are shown as a classic depiction of sustainability. The same literal 'pillars' and a concentric circles approach are depicted in Figure 3.1(b). (Purvis et al., 2019).

Perhaps, the best definition of sustainability may be to achieve a common and balanced development in all three areas, which is indicated in Figure 3.1.

- Economic Sustainability: To ensure that resources are used in the most efficient way, considering profitability. No economic activity can be sustainable without profitability.
- Social Sustainability: It means achieving sustainable social welfare. In the long term, it fulfills the social well-being of countries, communities, and companies.
- Environmental Sustainability: It is the consideration of the importance of environmental issues while ensuring the sustainability of economic development and social welfare.

The concept of Corporate social responsibility (CSR) emerges here, and it expresses that companies continue their activities within the framework of international standards with a sense of social responsibility. One of the most important pillars of this is sustainability (Benedict, 2015).

Industrialization, urbanization, and rapid population growth increased the environmental problems, which forced humanity to think and act together to find solutions. Believing in the limitlessness of the resources provided by the environment and its reckless use caused the resources to come to the point of depletion and the environment to be highly polluted with the effect of industrialization. The increase in pollution has caused social reactions by causing impacts on humans and the ecosystem. In order to improve human well-being, it is now critical to design a model that ensures the balanced and mindful use of natural resources, as well as harmony and coexistence with the environment, in the development to be attained. At this time, a sustainable development philosophy has been adopted, which ensures that development and industrialization aims and methods are consistent with the earth's physical infrastructure and that excessive resource waste is avoided. This may also ensure that all people on today's planet progress at a reasonable rate, and that resources exist to allow development in future generations' worlds. (Shave, 2012, p.66).

The concept of sustainability arose with the emergence of environmental problems to solve these problems. As a result, a sustainable development approach has been adopted on a national and international scale. Today, we can say that sustainable development is a vital concept of environmental protection policy, both nationally and internationally accepted. This concept, interpreted in various ways, can be defined as a process that aims for economic development without or less possibly damaging the environment. The idea of realizing economic growth without exceeding the carrying capacity of nature lies at the basis of this concept. The emergence of environmental problems and increasing concerns, the deterioration of the ecological balance, and the increase of health problems in parallel have revealed the principle of sustainability, which is important to the environment and development for the continuity of the World. This is a necessity for the security of all kinds of living in the ecosystem and the establishment of peace and balance between development and economy (Menteşe, 2017, p.383).

3.2. United Nations

Approved by the member states of the United Nations in 2015, the 2030 Agenda for Sustainable Development program draws peace and prosperity for people and our World. As can be seen in Figure 3.2, the 17 Sustainable Development Goals (SDGs) were offered to all countries that are aiming to ensure the peace, economic development, and prosperity of our World while considering climate change and working to preserve the planet (UN Development Report 2016-219).

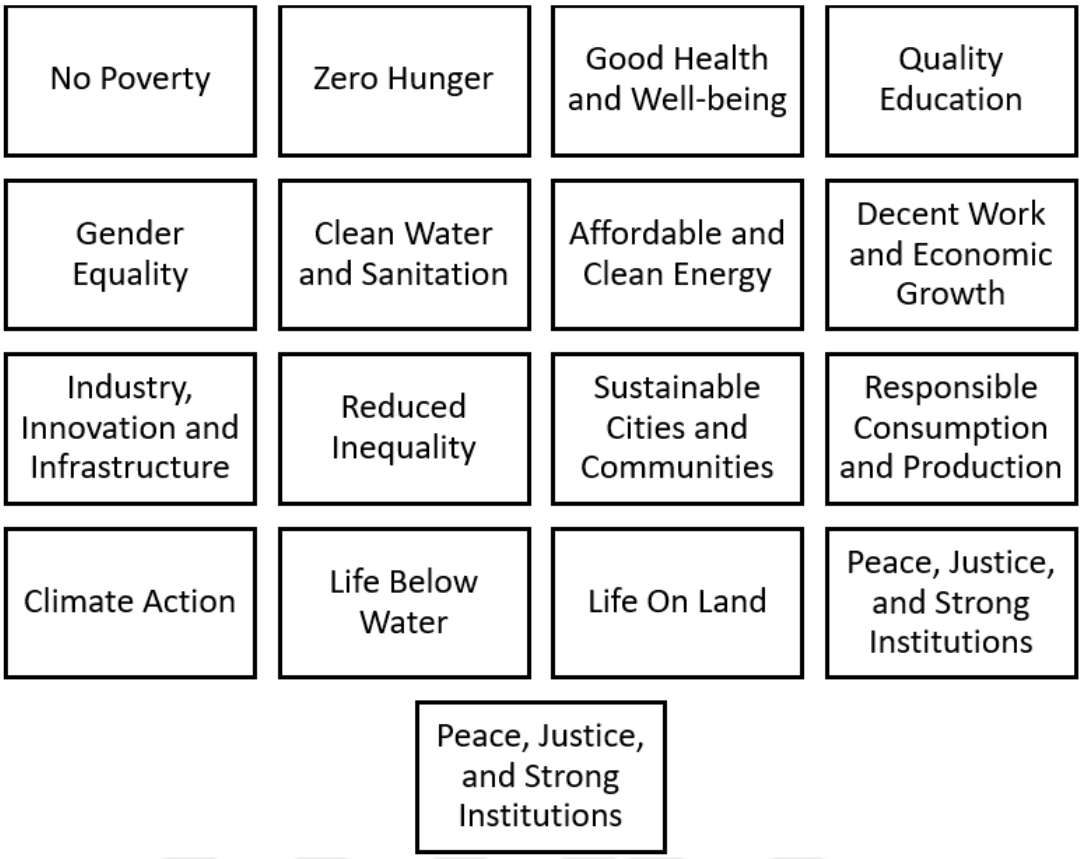

Figure 3.2. UN's Sustainable Development Goals (UN, 2016)

3.2.1. The Ten Principles of the United Nations Global Compact

The United Nations Global Compact is a voluntary project based on CEO promises to put global sustainability principles into practice. The ten principles of the UN Global Compact were listed under four main titles.

Figure 3.3. The Ten Principles of the UN Global Compact

3.3. Sustainability in Civil Aviation

Civil aviation is an integral part of the global economy and one of the rapidly growing industries in the World. However, civil aviation has a significant contribution to air pollution and local noise pollution. Depending on the continuation of the current growth trends, it has been becoming an important cause of global warming. The most significant global obstacle in terms of sustainable development is the pressure on the expansion potential of the industry, as the economic advantages of aviation are extremely important. Without far-reaching changes, aviation-related problems will multiply and worsen (Upham, 2003, p. 240).

Commercial aviation emits 2.4 percent of the world's carbon dioxide (Wright, 2019). The United Nations has unveiled CORSIA (Carbon Offset and Reduction Scheme for

International Aviation), the world's first global carbon offset strategy for aviation. It is hoped that by investing $ 40 billion in carbon reduction in the aviation industry, this plan will reduce CO2 emissions by 2.5 billion tons between 2020 and 2035. In addition, the International Airline Trade Association (IATA) devised the "Four Pillars" idea for airlines to achieve carbon-neutral growth by 2020, which encompasses technology, operations, infrastructure, and economic measures. (O'Malley, 2020).

The global aviation industry produced 915 million tonnes of CO2 in 2019, according to a report by The Air Transport Action Group (ATAG), whereas humans produced nearly 43 billion tonnes in total. It accounts for about 2% of all carbon dioxide (CO2) emissions.

4.5 billion passengers were transported by airlines in 2019. Around 0.5% of the total cargo shipments were carried by airlines, which is over 35%, which is very high value, perishable, and time-sensitive commodities. 10.2 million People are employed directly in aviation and over 65 million in aviation-related industries.

In this regard, the aviation industry makes a significant contribution to the global economy and plays an important role in both passenger and cargo transportation. There are also numerous studies that explain the favorable association between economic development and aviation in literature.

In the civil aviation industry, a generally accepted definition of sustainability still remains. Despite this, sustainability takes its place as the most important agenda of almost all national and international organizations of civil aviation. While sustainability in the sector is recognized as carbon emission and noise in a narrow sense, damages to the environment and social life are mostly expressed in the literature. As international actors on the subject, the UN, OECD, EU, and IPCC, and as international civil aviation actors ICAO, IATA, ATAG, and EUROCONTROL can be listed. Apart from this, airline associations, airports, ATC / ATM, non-governmental organizations and lobby groups, passengers, and cargo shippers are also important actors related to sustainability (Janic, 2016).

The aviation industry is undoubtedly one of the sectors that can be most effective in achieving a sustainable environment society and reaching the goal of sustainable development. The regulations of international conferences on the environment and sustainability and the effects of civil aviation and airports have been discussed on many different platforms. With the Kyoto Protocol for sustainable aviation, the United Nations Framework Convention on Climate Change, the Future of Air Transport Report, and the Energy File, policies are determined, and a legal framework is tried to be established. Emission trading is a regulation planned to be applied to the aviation industry (Oto, 2011, p. 22).

As the industry is growing rapidly, sustainability has become increasingly important in aviation. The amount of fuel consumed due to the increasing number of aircraft, factors such as international politics, and conflicts increase airline costs. The aviation industry has been a pioneer in the context of sustainability since the 1970s. The noise level of aircraft engines worldwide has decreased by 20 db. Fuel consumption has been reduced by 70% in the last 40 years. The industry is the pioneer of e-transformation. Paper waste is minimized not only in tickets but also in maintenance documents. However, airline routes, waiting times, lost time at ports, and insufficient traffic controls remain important issues. Despite these efforts, the usage of fossil fuels is expanding, and CO2 emissions are not falling as fast as they should. New fuel research and applications, on the other hand, are still ongoing. (Torum and Yılmaz, 2009, p. 50).

3.3.1. The International Civil Aviation Organization (ICAO)

ICAO has been taking it very seriously improving the environmental performance of aviation for decades. Three primary environmental goals were set by the ICAO Assembly during its 35th session in 2004, serving as a roadmap for the sector.

- to limit or decrease the number of persons impacted by substantial aircraft noise;
- to limit or decrease the negative impact of aviation emissions on local air quality; and

- to limit or decrease the global warming impact of aircraft greenhouse gas emissions.

Every three years, the ICAO Assembly reviews and updates its policies and procedures on environmental protection. These rules and procedures are included in Assembly Resolutions A40-17, A40-18, and A40-19 enacted in October 2019. Their major goal is to limit the negative environmental effects of civil aviation activities.

Dr. Olumuyiwa Benard Aliu, President of the Council declared in ICAO's Environmental Report 2019 that,

> ICAO's strategy is allowing the organizations to meet the goals set, including incentivizing innovative aircraft technologies, implementing more efficient operations, facilitating the use of sustainable alternative fuels, and developing a global market-based measure (CORSIA).

CORSIA was the first global market-based measure plan in any sector adopted at the 39th Session of the ICAO Assembly. CORSIA represents the implementation of a global plan developed through a global agreement between governments, industry, and international organizations. CORSIA intends to provide a unified approach to reducing emissions from international aviation while ensuring no market distortions, considering the unique circumstances of all ICAO member states. CORSIA additionally represents other components in the measuring basket by employing high-quality emission units from the global carbon market to offset CO2 emissions that cannot be decreased through technological and operational improvements and sustainable aviation fuels.

ICAO's environmental and sustainable policies and practices can be summarized as follows;

- Global Market-based Measure,
- Sustainable Aviation Fuels,
- State Action Plans,
- Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA),
- Technology Goals and Standards,

- Improvements to Aircraft Technology and Operations for Efficiency,
- Aircraft Noise,
- Environmental Assessment Air Traffic Management Changes,
- Environmental Tools (E-tools),
- ICAO Carbon Emissions Calculator,
- ICAO Fuel Savings Estimation Tool,
- Innovation,
- E-HAPI (Electric and Hybrid Aircraft Platform for Innovation),

3.3.1.1. Global Market-Based Measure

As an international authority, ICAO has the desire to act consciously in a sustainable environment. At this point, ICAO basically foresees the development of the role of airports and airline companies in the process. Based on this, ICAO has published environmental regulation as an obligation worldwide. In other words, for ICAO, all elements of the civil aviation sector must act in accordance with international regulations for a sustainable environment (Sameh & Scavuzzi, 2016, p.10).

Especially in recent years, the issue that ICAO has given the most priority to is the carbon emission problem. For this reason, ICAO's regulations on carbon emission are updated annually, and in this way, it comes to the fore to inform civil aviation actors in detail about the issue. At the same time, ICAO expects airports and airlines to align their regulations with ICAO's practices. Thus, all civil aviation actors can comply with the sustainable environment principle in harmony with each other (Rojas et al., 2019, p.4).

ICAO states that in the operation of airports, similar to every large industrial facility, it is essential to take the necessary measures, starting from the planning stage, to eliminate or reduce pollution at its source, and to establish practices and appropriate control and control systems that will reduce all kinds of negative effects and pollution during services. Sustainable construction can be defined as a dynamic in achieving sustainable development considering environmental, socio-economic, and cultural problems of new solutions developers, investors, the construction industry,

professional services, industry suppliers, and other interested parties. For ICOA, sustainability should not be used as a marketing strategy but as a natural part of the construction process without attributing a sacred (Gonçalves, 2017, p. 446-447).

ICAO has a strong vision of a sustainable environment in terms of civil aviation. Accordingly, ICAO aims to minimize the carbon emission problem in civil aviation by 2050. Creating various scenarios for this, ICAO has informed all international airline companies, airport management, and governments about each of these scenarios. In this informing process, the main goal of ICAO is primarily to explain the environmental seriousness of the process and then to increase the level of awareness on the subject. For ICAO, the most critical issue regarding carbon emissions is that short-term problems contain serious threats to the future (ICAO, 2016b, p. 8-9).

The international consensus is of paramount importance to the sustainable environment in general. In this regard, ICAO expects UN member countries to comply with the carbon emission policies determined by ICAO. In fact, ICAO works to ensure that national environmental policies are in line with the policies determined by ICAO. According to ICAO's point of view, the rapid growth of the civil aviation sector around the world can be considered as good financially. Still, this growth is a serious threat in terms of environmental problems. Therefore, ICAO expects airline companies and airports, as well as aircraft manufacturing companies to be in the process in harmony (Gençsü & Hino, 2015, p.5-8).

On the other hand, ICAO also benefits from technological elements to create a sustainable environmental understanding of civil aviation. It clearly determines the possible liabilities and road maps of airlines and airports particularly emission measurements and digital scenarios. At this point, ICAO develops joint studies with local aviation organizations and governments. These studies are on behalf of eliminating environmental problems and threats in civil aviation in the future. However, it supports the actors of the civil aviation sector in both financial and technical terms to reduce the threats in the current process (Sarkar, 2012, p.167).

3.3.1.2. Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)

From 2020, CORSIA seeks to achieve carbon-neutral growth in international aviation. During the process of the 2021-2035 plan, CORSIA is expected to cover 78 percent of the industry's CO2 emissions above 2020 levels. This level equates to 21.6 percent of the sector's emissions over the same period. More crucially, the plan's emissions reductions are contingent on the quality of offsets and alternative fuels approved (Climate Action Network, 2016, p. 3).

The CORSIA project is a worldwide initiative. As a result, CORSIA is expected to cut CO2 emissions by about 2.5 billion tons between 2021 and 2035, or 164 million tons per year on average. This equates to a $ 40 billion investment in climate projects (assuming that the price of carbon rises from $8 in 2021 to $20 in 2035). In order to include different circumstances and the different capabilities of countries, CORSIA will be implemented in three phases (Cokorilo and Tomic, 2019, p. 4-5):

- Pilot Phase: From 2021 to 2023, only flights between countries that volunteer in the first stages of the project will be subject to neutral CO2 growth measures.

- First Phase: From 2024 to 2026, all international flights will be subject to neutralization measures, except flights to and from third countries. An exception will be if these countries decide to participate on a voluntary basis.

- Second Phase: From 2027 to 2035, all air carriers must monitor and publish emission data recorded on all international flights, including third countries.

In practice, the presented cases can also be found under the heading "Route-based CORSIA approach", or this is an approach that shows which routes are subject to the implementation of CORSIA, depending on whether the countries between which flights are performed are connected to the CORSIA project.

3.3.1.3. Sustainable Aviation Fuels

According to the ICAO rules, those that have the characteristics of sustainable aviation fuel must experience at least 10% CO_2 reduction throughout the entire life cycle, different from traditional fuel values. The EU has reduced the numerical value in this regard to the range of 60% -65% CO_2. Direct emissions during operation from sustainable aviation fuel use have a higher risk of carbon emissions than fossil fuels. Therefore, policies on emissions need to be revised (Domone, 2019, p.17).

Sustainable aviation fuels are much more advantageous than other conventional fuel types in many respects. This situation reduces airline companies' dependence on conventional fuel and offers financial advantages. But most importantly, with sustainable aviation fuels, the sustainable environment goal is getting closer to reality to a large extent. Because if sustainable aviation fuels can be separated correctly and consumed in the right amounts, they can be used without harming environmental standards. For this reason, ICAO tries to guide airlines in using sustainable aviation fuel (ICAO, 2018, p.8).

According to ICAO's approaches to sustainable air fuel, sustainable aviation fuels can reduce CO2 lifecycle emissions by up to 80% compared to traditional jet fuel. Sustainable aviation fuels are achieved using sustainable fuel sources that do not compete with food or water or harm biodiversity. Sustainable aviation fuels have been certified as safe, sustainable, and ready to use due to extensive testing and investments by airlines. Currently, more than 250,000 flights are carried out with fuels blended with sustainable aviation fuels (ICAO, 2011, p. 41).

3.3.1.4. Other Environmental and Sustainable Policies and Practices of ICAO

Action Plans, Aircraft Noise, Technology Goals and Standards, Improvements to aircraft technology and operations for efficiency, Environmental Assessment of Proposed Air Traffic Management Operational Changes, Environmental Tools (E-tools) (ICAO Carbon Emissions Calculator, ICAO Fuel Savings Estimation Tool),

Innovation (Innovative Fuels, E-HAPI (Electric and Hybrid Aircraft Platform for Innovation), Technology Goals and Standards.

3.3.2. European Union, Emissions Trading System (ETS)

The European Commission decided to establish an Emissions Trading System (ETS) that aims to reduce CO2 emissions to 5% considering the level of 2006 by 2020, using a cap system. It will be implemented for all, including the aviation industry (EU Aviation Environmental Report 2019). However, after the adoption of CORSIA in 2016, the position of the EU ETS is still unclear. The EU Commission expects to decide on the elimination of the EU ETS and the implementation of CORSIA or the implementation of the EU ETS only for intra-EU/EFTA flights or a mixed solution of ETS-CORSIA. Industry, in general only supports the implementation of CORSIA to avoid confusion (IATA Reports 2019)

3.3.3. IATA Programs and Policies

IATA has placed the environment at the top of its agenda, together with safety and security. IATA establishes various projects and initiatives for the sustainability of aviation and suggests industry goals and targets guide its members and global air transportation.

IATA declared, “Air transport connects the world, bringing people and goods together. But the benefits of aviation also have an environmental downside. Emissions, noise, industrial processes, and waste must be managed by the industry, reduced, and where possible, eliminated. In addition, aviation has a role to play in tackling the global issue of wildlife trafficking.” (IATA Reports 2019).

According to the IATA’s Reports 2019, IATA’s environmental policies and actions for the environment can be itemized in figures 3.4, and 3.5.

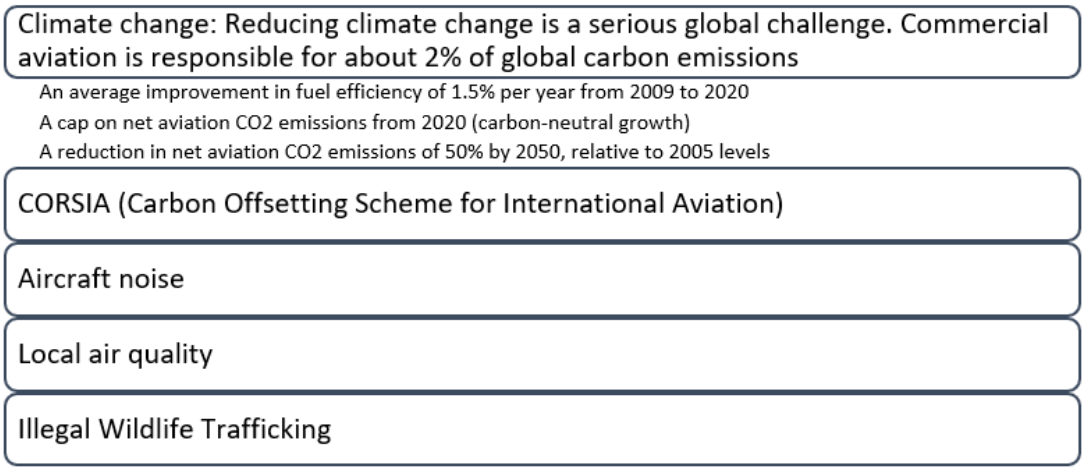

Figure 3.4. IATA's Environmental Policies

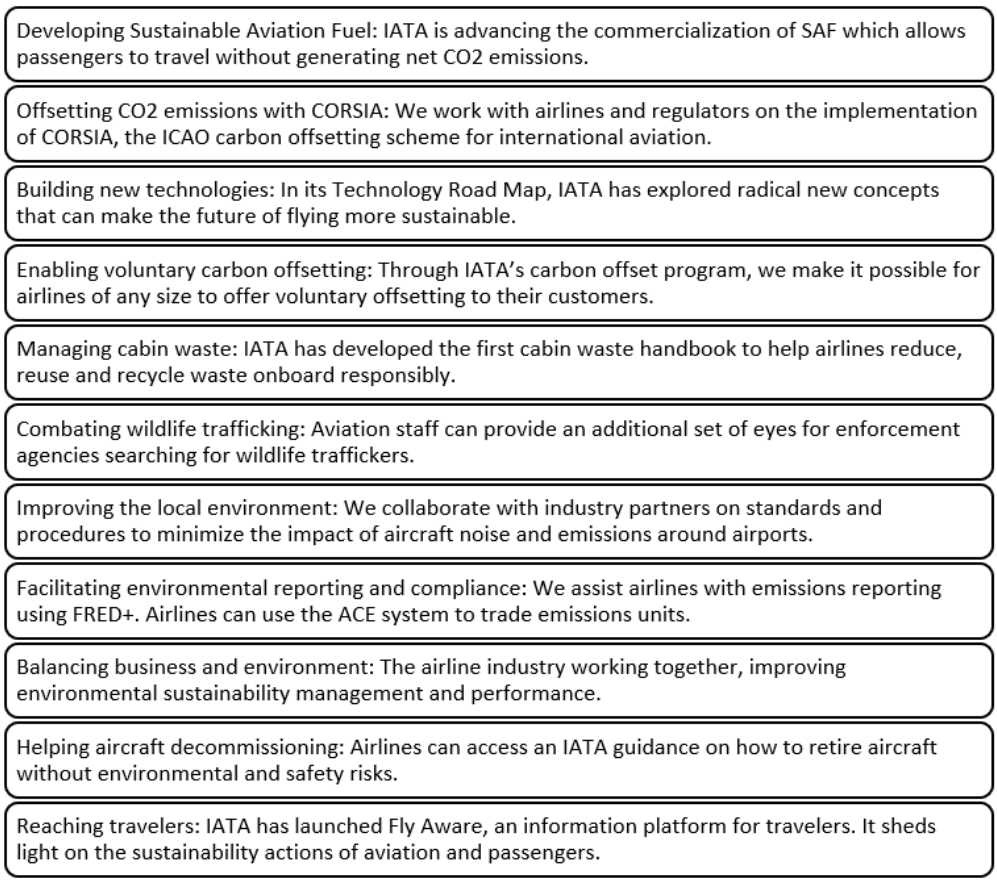

Figure 3.5. IATA's Actions for the Environment

The environmental program of IATA was also examined and broadly declared in the report. A summary of the program can be seen in figure 3.6.

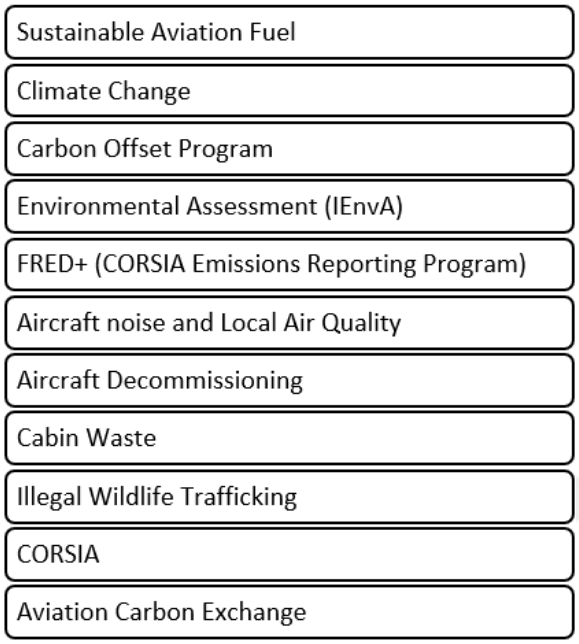

Figure 3.6. IATA's Environmental Program

3.3.4. Goals and Programs of Airline Alliances and Airlines

3.3.4.1. Global Airline Alliances

Global airline associations are also constantly increasing their sustainability activities and plans. They set mandatory or voluntary targets for their members, other than the obligations of national or international institutions and organizations. In order to achieve these goals, they establish initiatives and provide the necessary support to their members (Sánchez et al., 2019).

Global Airline Alliances' action plans generally focus on Carbon Offsetting, Sustainable Aviation Fuel, and Waste Reduction. However, airlines must also develop a strong communication strategy to share their sustainability activities with the public. Star Alliance Sustainability Action Plan consists of five main areas: Waste Reduction Management, Supply Chain Management, Sustainable Aviation Fuel, Carbon Offsetting, and Sustainability communication strategy.

3.3.4.2. Airlines

Airlines also develop various activities and plan related to the environment by following the policies of international institutions and organizations. For instance, Ryanair's Sustainability Voluntary Carbon Offset Program suggests that passengers a voluntary contribution of €2 per ticket. Air New Zealand provides funding to landowners to plant trees. THY uses recyclable plastic, aluminum, and paper, and all wastes are recycled.

United Airlines has been the first airline to operate its flights using SAF (sustainable aviation fuel) continuously since 2016. Until the end of 2020, it was the airline flying the most with SAF among the global airlines.

Since 2009, United Airlines and AltAir have worked together to deliver a sustainable aviation biofuel supply to an airport. AltAir has increased its stake in the Paramount Petroleum Corporation (Alon USA Energy subsidiary) refinery in Paramount, California, in order to offer clean energy to the Los Angeles area and produce 35 million gallons of advanced renewable fuel per year.

Compared to conventional petroleum-based jet fuel, the facility, which transforms non-renewable natural oils and agricultural wastes into jet fuel, is predicted to reduce carbon emissions by more than 60%. AltAir's fuel complies with ASTM D1655, the same standard as traditional jet fuel. Furthermore, AltAir is certified by the Roundtable on Sustainable Biomaterials (RSB), a global sustainability standard and certification system that acknowledges biomass and biofuel producers who adhere to demanding social and environmental standards (United Airlines, 2021).

The Eco-Skies Alliance is a program that includes leading global companies working with United to provide more sustainable flights. This innovative program offers United's corporate clients the opportunity to reduce their environmental impact and make sustainable aviation the norm. This group of leaders believes that serious actions are needed to decarbonize aviation.

United is the only airline on the 2020 Climate 'A-List' for its initiatives to cut emissions, mitigate climate risks, and promote a low-carbon economy, according to the Carbon Disclosure Project. This is the sixth year that United has earned the best CDP score of any US airline (United Airlines and Biomass Magazine, 2021)

An electric vertical take-off and landing (eVTOL) aircraft, on the other hand, uses electric power to hover, take off, and land vertically. Without the use of a runway, these vehicles take off and land vertically. Instead of traditional internal combustion engines, they use electricity, and Airbus and Boeing are continuing to innovate in this field.

It is predicted that eVTOL vehicles will enter our lives in the 2030s, and it is thought that eVTOL initiatives, which are on the way to obtaining the US Federal Aviation Administration certificate, will bring radical changes in air transportation after the safety criteria are completed. Electric flying vehicles, which will attract traffic to a different areas in urban transportation, will play a major role not only in urban mobility but also in cargo transportation (Airbus, 2021)

- Beta Technologies' eVTOL aircraft will be able to land at UPS facilities in the small and medium markets.
- While UPS improves network resilience, it benefits healthcare providers and small and medium-sized businesses.
- The charging stations, which are presented as a flexible and sustainable solution to reduce air transport emissions, will also be usable by electric land vehicles.
- These aircraft will also take off and land very quietly, reducing transport time, vehicle emissions, and operating costs.

In 2018, Turkish Airlines registered with the Zero Waste Information System, which has already been used in all its Istanbul and domestic buildings and campuses via the Electronic Environment Information System.

Within the scope of the Zero Waste Project, 50% paper saving was achieved, and waste generation was prevented by enlarging/reducing the size of the papers by the

Directorate of Social and Administrative Affairs, Management of Facilities, and Printing Department.

The separation of waste at the source is one of the most significant objectives of the Zero Waste Project. As of January 2020, Turkish Airlines planned to remove under-table trash cans according to the Zero Waste requirement in all buildings and campuses in Istanbul.

Turkish Airlines has also successfully developed and implemented over 100 operational optimization projects since 2008, resulting in a total efficiency rate increase of roughly 20%. The goal was to improve fuel efficiency while lowering expenses and pollutants.

Every kilogram of gasoline saved prevents the emission of approximately 3.15 kilograms of carbon dioxide (CO2). To achieve this goal, various initiatives to improve fuel efficiency and reduce carbon footprint were implemented.

Through the fuel-saving initiatives, Turkish Airlines saved 29.608 tons of fuel, corresponding to 93.267 tons of CO2 emissions avoided in 2018. This is equivalent to the removal of 33.645 cars daily from the roads in Istanbul or planting over 270.000 trees per year or operating 2.800 flights between Istanbul and London with a narrow-body aircraft. As of the end of October, 47.682 tons of fuel were also saved, corresponding to 150.198 tons of CO2 emissions in 2019 (Turkish Airlines Sustainable Report, 2018)

CHAPTER IV

LITERATURE REVIEW AND CONCEPTUAL BACKGROUND

Sustainability and environmental impacts have been studied in abundance, focusing mainly on the companies' evolution of environmental behaviors together with policies and practices that aim to find a balance between maintaining the company's working capacity and economic development on the one hand and reducing environmental impacts and promoting social equity on the other hand.

As a matter of fact, aviation is a sector today where sustainability and environmental concerns are at the front and center as airline and airport companies endeavor to be environmentally friendly. Therefore, various studies are carried out by the academy and the companies themselves to investigate such issues.

In addition, there have been many studies on the voluntary contribution of passengers to sustainable and environmental activities. Consumer behaviors and reactions related to the subject were widely examined.

Ragbir et al. (2021) look at the link between sustainability knowledge and willingness to pay for greener flying. The goal of the study was to determine which characteristics operate as crucial mediators between a participant's general knowledge of sustainability, aviation-specific knowledge of sustainability, and willingness to pay for greener aircraft. Caring and happiness were the two significant mediators of willingness to pay in both independent variables, according to the causal mediation study. These findings show that a person's level of pleasure and concern for sustainability in aviation explain why they would be willing to pay more for sustainable practices. As more and more sustainable programs are implemented around the world, it is critical that the aviation sector endeavor to incorporate sustainable practices into airports, aircraft, and overall operations. The findings of this study

corroborate findings from previous studies on consumer readiness to pay more for flights operated on biofuels and the use of environmentally friendly construction materials in airport development and restorations. (Ragbir et al, 2021).

Another recent study on the relationship between airline ticket price increases, reductions in greenhouse gases, and passengers' willingness to pay provided additional insights on the topic. Within the study, two experimental field studies were carried out, in which participants were offered hypothetical cases about flying in a commercial aircraft to reduce greenhouse gases by 10-50% in 10% increments. The first part of the experiment focused only on short-haul domestic flights, whereas the second one underlined long-haul international flights. According to the findings of the first study, participants are more likely to pay the higher ticket price if they believe that greenhouse gas emissions will be reduced. The willingness of participants to pay additional fees was also affected by the increase in ticket prices. Overall, it appears that women are more willing to pay the higher ticket price than males. When it comes to long-haul flights, participants are more willing to pay a higher ticket price if greenhouse gas emissions are reduced. Furthermore, contrary to Study 1, the gender effect is not a significant variable in this study (Rice et al., 2020)

Within a specific demographic sector in the UK, MacKerron et al. (2009) evaluated WTP (Willingness to Pay) for VCOs (voluntary carbon offsets), offset certification schemes, and a variety of generic co-benefit types. The study found that participants were willing to pay more for all three forms of co-benefit offsets. Biodiversity, human development, and low-carbon market/technology development are among these advantages. This suggests that by emphasizing such shared benefits, policymakers can purchase more VCOs. (MacKerron et al., 2009).

Lu et al. (2012) surveyed over 1000 Taiwanese passengers to investigate airline passengers' willingness to pay for sustainability initiatives. The cost of an air trip, the purpose of travel, the class of seats, the subsidies granted, the frequency of traveling overseas, and age are the elements that specify the WTP for an emission offset, according to the study's findings. Participants' WTP is primarily determined by their conviction in the effectiveness of the carbon-offset strategy and their environmental

responsibilities. It's also revealed that the larger the first offer's sum, the higher the WTP mentioned at the conclusion (Lu et al., 2012).

A primary research issue was the impact of plane passengers' environmental knowledge on attitudes toward carbon offsetting. The study also tries to determine why people are willing to reduce aviation's environmental impact (Lu and Wang, 2018). The study examines the effects of two forms of communication media on passengers' understanding of aviation's environmental concerns. The passengers' attitudes toward carbon offsets were assessed, as well as their willingness to balance their flights or adjust their travel habits. According to the findings, there is a positive relationship between knowledge, attitude, and behavioral intention. Furthermore, information has been shown to alter participants' readiness to balance flights (WTO) and change travel behavior in both direct and indirect (i.e. through attitude) ways (WTC). The study's findings suggest that governments should enact legislation encouraging airlines to invest more resources in meeting international norms for aircraft emissions, as well as collaborate with airlines to better inform passengers about aviation emissions and the benefits of carbon offsets.

Chiaramonti (2019) explored sustainable aviation fuels in an attempt to clarify the challenge of decarbonization'. In this study, aviation fuel perspectives were briefly examined in terms of demand and GHG (GreenHaus Gas) emission trends, possible routes to jet fuel production, and the status of ASTM (The International Association for Testing Materials) certified jet routes (Chiaramonti, 2019). According to the study, the development of Sustainable Aviation Fuels would be a major activity within the framework of the new policy that is defined by the new Renewable Energy Directive (REDII) in the European Union in the coming years. In order to achieve greenhouse gas emission reduction targets, it will be necessary to expand production capacity, invest in new pilot and demo plants, bear high costs to obtain certification, and make a significant investment in new industrial plants.

Alameeri et al. (2017) studied UAE-based airlines with regard to sustainability practices and their effects on the environment, which aims to define, classify and prioritize such practices carried out by airline companies. According to the results of the study, it is clarified that government management and innovation management are

equally prioritized in the UAE's national aviation sustainability practices. While the most important practice in government administration is to comply with law and policy requirements, the most important sustainability practice in innovation management is innovations in the field of marketing.

The research also showed that UAE airlines focus on providing the proper disclosure, legal revenues, and management system at the shareholder management level. At the customer management level, the airline has mostly emphasized the importance of innovation and development. Moreover, the results indicated that ethical operation and counterfeiting practices in the foreign market are essential to ensure sustainable business in UAE airlines (Alameeri et al., 2017).

In another study, Winter et al. (2019) conducted a multi-modal analysis to look at the aviation industry, in general, to see what elements might influence a consumer's willingness to support environmental sustainability in aviation. The goal of this study is to evaluate variables that reflect a consumer's propensity to support sustainability in aviation in general, biofuel use, airport construction, and aircraft manufacture using several models. According to the findings of this study, as effect assessments improved, so did support for sustainability. Positive attitudes, such as passion and excitement, have also been found to improve support for green products due to research (Winter et al., 2019).

Another study exploring consumer preferences for aviation carbon offsets and offsetting activity in the Australian market aims to determine consumer preferences for aviation carbon offsets and offsetting behavior. The study created a model to calculate the economic value of aviation carbon reductions and identified the most important elements influencing airline passengers' voluntary sustainable behaviors.

Passengers are willing to pay AU$21.38 per tonne of reduced CO2 as a form of voluntary carbon offsets per person, according to the data. Female passengers may have a larger carbon-offsetting economic value than male passengers. However, climate skeptics, who are less likely to be carbon mitigators, may have a greater (willingness to pay) value of AU$28.92 than non-skeptical passengers.

The results also suggest that the best profile of offset projects may be renewable energy projects in developing countries regarding willingness to pay. It may help airlines and companies to reduce their legal liabilities of carbon offsetting credits. The result also positively and more strongly supports the improvement in technological efficiencies than the operational practices and biofuels in terms of carbon offsetting measures taken by airlines (Choi and Ritchie, 2014).

CHAPTER V

HYPOTHESES TESTING

5.1. Perception of Sustainability Practices

In literature, there has been plenty of research examining the perception of customers toward companies' sustainable activities. This context basically describes how much customers find companies or institutions environmentally friendly and interested in environmental activities.

Strähle and Köksal (2017) studied whether country and brand image affect consumers' perception of suppliers' or companies' sustainable activities in the fashion market. They found a positive direct effect on customer perception. Dabija, et al (2017) addressed to evaluate the perception of stakeholders regarding Romanian university on its sustainability orientation by deploying a questionnaire. Another research focused on Spanish national park users' perception of sustainability (Perez, et al 2020). In almost all studies, it was asked whether customers or stakeholders found the institutions green and environmentally friendly and their level of perception of sustainability.

In our study, we aimed to measure the perceptions of the passengers regarding the sustainability activities of the airlines. We tried to reveal whether these activities create a green airline perception and are considered important.

5.2. Willingness to Pay

As indicated in the literature review, the willingness to pay is described as a contribution, effort, or supportive behavior of customers to environmental activities (Choi and Ritchie, 2014).

Lots of major initiatives and projects on environmental issues have been developed in the aviation sector in recent years. Although these efforts are sometimes required by law, airlines have been developing sustainable projects and practices in order to show their sensitivity to environmental issues, which affect customers' behavior and purchasing decisions positively and directly (Strähle and Köksal 2017). As reported by Lu (2009), the costs of environmental and social externalities of air transport must be internalized and paid for by the aviation industry and its users. However, airline passengers have different attitudes toward such policies (Lu, 2009; Lu and Shon, 2012).

In this study, we aimed to find out the willingness of passengers to voluntarily contribute to such sustainability projects and activities developed by airlines.

5.3. Passenger Profile

In this study, passengers are classified according to their preference for the airline business model. We measure their tendency to two main specific business models. Generally, we associate low-cost airlines with leisure passengers, whereas business passengers prefer full-service carriers.

Although there have been many business models preferred by airlines (see Table 2.1, Klemm et al, 2018), low-cost and full-service business models are considered as two main groups in the study. With the data obtained from the survey, the profiles of the passengers were determined according to which of these business models they are more inclined to prefer. Thus, passengers were examined in two groups: low-cost or full-service passengers. According to Lu (2009) and Kuljanin and Kalić (2015), leisure passenger is more cost-sensitive than business travelers. Therefore, we expect that the passenger profile may have a moderating effect on these two constructs, the perception of sustainability practices and the willingness to pay.

5.4. Modelling and Research Questions

As indicated in Figure 5.1, we aimed to analyze the relationship between airline passengers' perception of sustainability practices and their wish to make voluntary

financial contributions to sustainability practices. Additionally, any possible moderation effect of the passenger profile, in other words, airline preferences of passengers on this relationship has been measured.

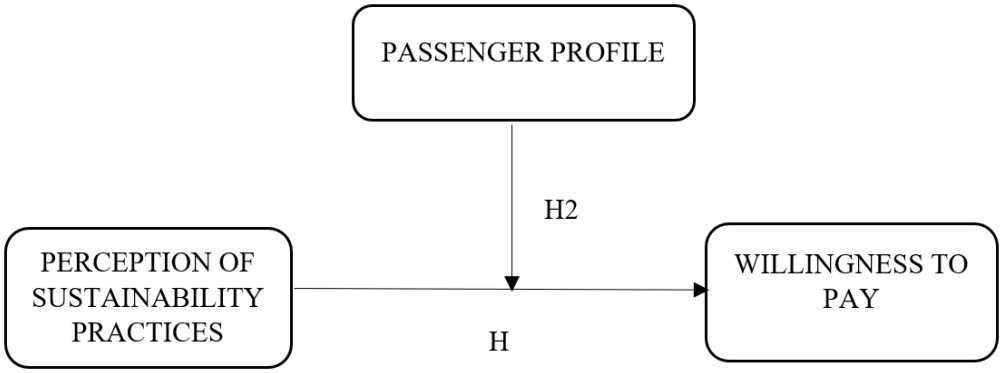

Figure 5.1. Conceptual Research Model

Based on the initial findings reported above, we propose the following hypotheses.

H_1: The perception of sustainability practices has a direct and positive effect on the willingness to pay for sustainability practices.

H_2: There is a moderator effect of passenger profile on the relationship between the passengers' perception of sustainability practices and their willingness to pay for sustainability practices.

5.5. Methodology

In order to collect the necessary data, a questionnaire was designed. The questionnaire is composed of three sections. While the first section collects some personal data such as gender, age, etc. the second section measures the passengers' profiles. Finally, the third section aims to measure the passengers' awareness of the sustainability-related policies in aviation and their perception of the sustainability activities of airlines. The main question is whether the environmental activities of the airlines have an impact on the airline preferences of the passengers considering the airline business model.

At first, the validity of the questionnaire was tested with a small number of groups. After testing and required revision, the survey was conducted among a sample group of passengers in the Turkish civil aviation market via the online survey platform on

Google. 698 participants responded to the questionnaire, which is considered a reflection of the total population.

The design of the research was quantitative. Correlation, regression, and factor analysis were performed in order to test the hypothesis by using IBM SPSS.

5.6. Results and Conclusions

5.6.1. Demographic Characteristics of Participants

The summary statistics related to the sample in which the research was conducted are given in Table 5.1. Questionnaires were applied to the participants who declared that they traveled with an airline in the last year and were determined by the random sampling method. Furthermore, they were asked if they agreed to participate in the survey. In the study, a total number of 698 questionnaires were received, and the 508 usable questionnaires were analyzed from the sample.

Table 5.1. Summary Statistics of Survey Participants

		Frequency	**Percentage**
Age	18-30	206	40,6
	30-40	206	40,6
	40-50	68	13,4
	50-65	28	5,5
Gender	Male	199	39,2
	Female	309	60,8
Education	Under High School	21	4,1
	High School	57	11,2
	Undergraduate	323	63,6
	Graduate	87	17,1
	Ph.D.	20	3,9
Average number of air travels per year	1-2	245	48,2
	3-5	132	26
	5-10	61	12
	More than 10	70	13,8
Purpose of travel by airplane	Leisure	377	74,2
	Business	131	25,8
	Total	508	100

Table 5.1 includes demographic information about the participants. In terms of gender, it is seen that 39.2% of the respondents are male, and 60.8% are female. The age range of people who prefer airplane trips is generally between 18-34 and 30-40, and 81.2% of the participants are under 50. Furthermore, 63.6% of the participants are undergraduates, 17.1% are graduates, and 3.9% are Ph. D. In addition, almost half of the participants (48.2%) travel by airplane 1-2 times a year. In addition, it was observed that the most purpose of the participant's trip was leisure (74.2%).

5.6.2. Validity and Reliability Analysis

Validity and reliability analysis are among the issues that need to be addressed with priority. Therefore, the validity and reliability values of the questions in the study should be questioned. The results obtained from the scales that do not provide the required validity and reliability values will be suspicious. Scores discussed in this section are Scale Composite reliability (SCR) coefficient, Average Variance Extracted (AVE), and Cronbach's Alpha (CA) coefficient.

SCR coefficient is used to determine whether convergent validity can be achieved. This value should be greater than 0.70, and its value should be greater than the AVE value calculated for that factor (Bacon et al., 1995). When Table 5.2 is examined, it is seen that the SCR coefficient of both elements is high and convergent validity is ensured.

Table 5.2. Validity and Reliability Analysis

	Avg.	**SD**	**Scale Composite Reliability (SCR)**	**Average Variance Extracted (AVE)**	**Cronbach's Alpha (CA)**
Perception of Sustainability Practices	3,860	0,818	0,920	0,568	0,901
Willingness to Pay	3,110	0,895	0,822	0,537	0,703
General	3,690	0,722	0,942	0,558	0,894

The discriminant validity of the data is examined with the AVE value. The average variance of the questions in the factor must be higher than 0.5 (Fornell, Larcker, 1981). It has been determined that for both of the factors we have examined, the average variance is greater than 0.5 in AVE.

The coefficient used to calculate the internal consistency of the factors is the Cronbach's Alpha coefficient. Cronbach's Alpha, which is the coefficient that best reflects the reliability of the scale, expresses the total reliability values of the questions in a factor. A Cronbach's Alpha coefficient value of 0.70 and above is considered to indicate a high level of reliability (Hair et al., 2014; Özdamar, 2004). When Table 2 is examined, the Cronbach's Alpha coefficient of Perception of Sustainability Practices was found to be 0.901, and the coefficient of Willingness to Pay was found to be 0.703. It is seen that the Cronbach's Alpha coefficient obtained in the general evaluation is 0.894. Accordingly, it is understood that the internal consistency of these two factors is high in the study.

5.6.3. Correlation Analysis

Table 5.3. Results of Correlation Analysis

	1	***2***	***3***	***4***	***5***	***6***	***7***
Age	1,000						
Gender	,286**	1,000					
Education	-,112*	-0,052	1,000				
Average number of air travels per year	0,070	,178**	,313**	1,000			
Purpose of travel by airplane	,105*	,243**	,227**	,391**	1,000		
Perception of Sustainability Practices	0,087	-,118**	-0,083	-0,049	0,008	1,000	
Willingness to Pay	0,029	-,123**	-0,027	0,023	-0,025	,477**	1,000

* p<0.05; ** p<0.01

Table 5.3 shows the correlation values of the variables used in the model. Correlation is a term that allows an understanding of the direction and severity of the linear relationship between two variables. The correlation coefficient takes values between -1 and +1. As the values get closer to -1, they show a strong negative relationship, and as they get closer to +1, they show a strong positive relationship (Hair et al., 2014; Tabachnick & Fidell, 2001). When the table is examined, the dependent and independent variables in the model showed the highest correlation. It is observed that the relationship between these variables and control variables is of low intensity.

5.6.4. Factor Analysis

Table 5.4. Results of Factor Analysis

	Perception of Sustainability Practices	**Willingness to Pay**
S4	0,850	
S6	0,847	
S1	0,842	
S3	0,839	
S5	0,806	
S2	0,757	
S9	0,633	
S7	0,583	
S10	0,543	
WP4		0,803
WP2		0,746
WP5		0,705
WP3		0,670
% Descriptive Variance	46,191	10,873
KMO	0,908	0,720
Bartlett Test of Sphericity	2614,226***	569,059***
Notes	*(i) Promax Rotational Principal Components Analysis was applied. (ii) Total variance explanatory power was found to be 57.07%.*	

The factor analysis results are given in Table 5.4. Factor analysis, which is a data reduction method, is one of the statistical methods which enable the representation of a large number of variables with fewer and more significant variables (Thompson, 2004). In this method, while the variables in a factor have a high correlation with each other, they have a low correlation with the variables in other factors. Regression scores obtained by factor analysis can also be used in regression analysis (Tabachnick & Fidell, 2001). Kaiser-Meyer-Olkin (KMO) sample adequacy test and Bartlett sphericity test were used to test the suitability of the analyzed data set for analysis. According to the tests, the KMO value should be above 0.70 for sample adequacy. The values we obtained here are 0.908 for Perception of Sustainability Practices and 0.720 for Willingness to Pay for sustainability practices. In addition, the significant Bartlett sphericity tests indicate that the data set is suitable for factor analysis (Thompson, 2004; Field, 2007; Hair, 2014).

In this study, Promax Rotation Principal Components Analysis was used, and the analysis shows that the rate of explanation of the total variance with 2 factors was 57.07%. As a result of the factor analysis, the first question on Willingness to Pay for sustainability practices and the eighth question on Perception of Sustainability Practices were excluded from the analysis due to their low-factor loads. Since the number of samples was larger than 200, the factor load values were taken as 0.50 at the lowest (Hair et al., 2014). When the factor loads obtained are examined, it is seen that the lowest factor load is 0.543.

5.6.5. Testing Hypothesis

Regression analysis is widely used in social sciences in analyzing and modeling the relationship between dependent and independent variables (Tabachnick & Fidell, 2001). However, in the regression analysis, the relationships are analyzed one by one. Path analysis, on the other hand, is a type of structural equation modeling that allows all of these relationships to be shown together (Kline, 2015). In addition to whether the regression coefficients in this study are significant or not, the differences between the models for low-cost and full-service groups will be examined (Şimşek, 2007).

Accordingly, the moderator effect of the passenger profile was questioned by multi-group analysis (Hayes, 2009).

Table 5.5. Hypothesis Tests

	Low Cost		**Full Service**	
Regression Relations	*β*	*Std. Err.*	*β*	*Std. Err.*
Perception of Sustainability Practices → Willingness to Pay	0,473***	0,055	0,463***	0,066
Control Variables				
Age → Willingness to Pay	0,053	0,054	-0,071	0,059
Gender → Willingness to Pay	-0,101*	0,095	-0,053	0,105
Educational Status → Willingness to Pay	0,004	0,065	0,017	0,067
Average number of air travels per year → Willingness to Pay	0,062	0,050	0,023	0,053
Purpose of travel → Willingness to Pay	-0,015	0,124	-0,040	0,125
R^2 Values	*0,240*		*0,224*	
Goodness of Fit Test Values	***AIC***	***BIC***	***GFI***	***RMR***
Basic Model	*1050,783*	*1052,988*	*0,925*	*0,052*
Test Model	*1041,748*	*1043,539*	*0,924*	*0,054*
Comparison Results	**χ^2**	**df**	**$\Delta\chi^2$**	**Δdf**
Model comparison	986,783***	30	2,965 (n.s.)	6
Moderator Relationship Comparison	986,783***	30	0,278 (n.s.)	1

* p<0.05; ** p<0.01; *** p<0.001

When the results are examined, as indicated in Table 5.5, it is seen that the Perception of Sustainability Practices of the participants who prefer low cost has a positive and significant effect on the Willingness to Pay for sustainability practices (β = 0.473; p<0.001). Likewise, for the participants who prefer full service, it was revealed that the Perception of Sustainability Practices of the participants had a positive and significant effect on their Willingness to Pay for sustainability practices (β = 0.463; p<0.001). It is seen that the relationships obtained for both models are significant and effective. In addition, the effects of age, gender, education level, the annual average number of air travel, and the purpose of traveling by plane, which are considered control variables, on Willingness to Pay for sustainability practices were examined.

The explanatory values of the models were found to be 24% for low-cost and 22.4% for full-service, respectively.

Goodness-of-fit values are used to question whether the models are acceptable. Akaike Information Criteria (AIC) and Bayesian Information Criteria (BIC) were also used to compare the models. Low values; in other words, small values, represent a better fit (Kline, 2015). GFI, RMR, AIC, and BIC values of the goodness of fit values of the models are also given in the table. Accordingly, a GFI value greater than 0.90 indicates an acceptable fit. In addition, an RMR value of less than 0.08 and close to zero indicates a good model fit (Tabachnick & Fidell, 2001; Hooper et al., 2008). According to the given values, it is understood that the model has a good fit.

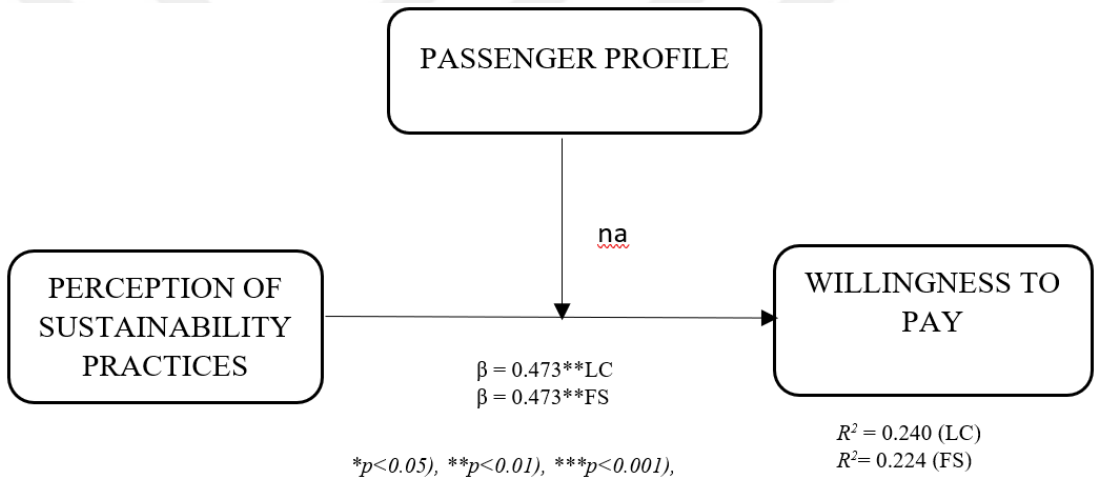

Figure 5.2. Graphical Display of Research Model Results

The χ^2 value was used to compare the path coefficients of the two models (Mohd Suki, 2015). Accordingly, it is understood that the model is significant. In addition, according to the χ^2 difference test, it is understood that there is no significant difference between the models for low-cost and full service ($\Delta\chi^2$=2.965). In addition, it is observed that the passenger profile does not make a significant difference ($\Delta\chi^2$=0.278) in the effect of Perception of Sustainability Practices on Willingness to Pay for Sustainability Practices. The graphical representation of these relationships is given in Figure 5.2.

CHAPTER VI

CONCLUSIONS

As a result, it has been determined that the positive effect of the Perception of Sustainability Practices on Willingness to Pay for Sustainability Practices is significant. It is seen that there is only a 1% difference between the β coefficients. Therefore, the H1 hypothesis was accepted.

However, it was observed that Airline preference (Passenger Profile) did not have a significant effect on the Perception of Sustainability Practices on Willingness to Pay for Sustainability Practices effect. It means that Airline preference (Passenger Profile) did not have a moderator effect. Therefore, the H2 hypothesis was rejected. In other words, it showed that passengers' business model preferences, whether low-cost or full-service and tendencies of Willingness to Pay for Sustainability Practices are similar.

The study shows that environmental issues are given great importance by the participants. This is proof that environmental issues and sustainability activities are basic expectations of passengers. From this point of view, we can assume that people will be willing to contribute to these activities voluntarily.

In this context, as it has been proven in many studies and as shown in this study, green airline perception positively affects passengers' voluntary contribution to new practices supporting sustainability. In other words, passengers stated that they could contribute to these activities if they have the perception that the airline respects the environment and develops sustainability projects in order to prevent environmental pollution and climate change.

It shows that airlines, which are seen as a major source of environmental pollution, particularly in terms of CO_2, need to develop more innovative projects. At the same time, airlines must actively contribute to or be a part of other sustainability projects.

Airlines can reinforce the perception of green airlines by explaining their sustainable projects in their publications or sustainability reports. In this way, airlines may increase the interest of the passengers in environmental issues and position themselves as the environmentally friendly airline preferred by the passengers. They can also increase passengers' awareness and contribution to such activities.

Another important result of the study is that there is no significant moderation effect on the passenger profile, in other words, their preference for low-cost or full-service airlines. Therefore, whether passengers prefer a low-cost or full-service airline, they expect airlines to be environmentally friendly and develop sustainability activities. In this context, regardless of the airline's choice of business model, they must take an active role in sustainability activities and create a green airline perception. It is obvious that these activities will be costly. However, both sustainability and the preference of passengers are more important than the cost. In particular, airlines that prefer the low-cost model will need to be more active in these matters. Most likely, passengers may think low-cost airlines will be less involved in these activities due to cost concerns. Future studies may aim to measure this perception or expectation.

Another critical issue is that the survey questions prepared to determine the airline business model preference and the tendency of the passengers should be in the form of whether they would pay for additional flight services or pay less by giving up some flight services. As a result of the analysis, it was determined that such questions were answered more clearly in the survey, and they had a significant impact on the determination of the passenger profile. Other questions that did not directly indicate financial gain or additional fees could not be used and were excluded from the survey during the analysis. It should be noted for future research that passengers should directly be asked how much they will pay when they choose an additional service such as comfortable seats, additional baggage allowance, and seat selection. Likewise, it should be clearly stated how less they will pay when a flight service is not preferred.

Within the concept of "willingness to pay", passengers should be asked not only whether they will contribute or not but also at what rate they can contribute. With this research, it will be possible to measure to what extent the passengers are ready to contribute. Likewise, the effectiveness of the project that passengers intend to

contribute can be a separate research topic. The hypothesis that passengers will contribute more to projects with a high influence on the environment should be evaluated.

Lastly, the study coincided with the Covid-19 pandemic, and the survey had to be administered at a time that passengers traveled less. This is a significant limitation of this study which can be improved by repeating the survey after the end of travel restrictions.

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APPENDIXES

APPENDIX A
SURVEY QUESTIONS

A. **General Questions**

1. Your age?
    1) 18-30
    2) 30-40
    3) 40-50
    4) 50-65
    5) over 65
2. Your gender?
    1) Male
    2) Female
3. Your educational status?
    1) Below High School
    2) High School
    3) University
    4) M.Sc.
    5) Ph.D.
4. How often do you travel by plane in a year?
    1) 1-2
    2) 3-5
    3) 5-10
    4) more than 10
5. How would you describe your purpose of traveling by plane in general?
    1) For holiday purposes (Travel, family-friend visit)
    2) For business purposes (Exhibition, conference, meeting, training)

B. Full-Service & Low-Cost Passenger Profile

6. The price of the ticket is the most important factor in my choice of airline.

7. The airline's primary service is to get me safely from one point to another. Other services are additional and must be paid separately.

8. By paying less, I can accept less flight comfort and additional service.

9. Flying should be comfortable; I prefer to fly more comfortably by paying more.

10. The prestige of the airline I fly is important, I prefer the prestigious one even though the price is high.

11. It is worth paying more if I know that the airline will take care of me adequately in unexpected situations such as flight cancellations or delays.

12. I prefer the more comfortable and prestigious airline by paying 30% more.

C. Perception of the Airline's Environmental and Sustainability Policy

13. I care that my airline has a carbon emission (CO2) reduction program.

14. I prefer airlines to have airplanes with new fuel-efficient technologies.

15. I prefer an airline that prefers and develops alternative environmentally friendly fuels besides fossil fuels.

16. It is important that my airline has a strict carbon emissions (CO2) offsetting plan and strategy.

17. It is important to me that my preferred airline tries to reduce disposable products made of plastic or aluminum.

18. I care that my preferred airline uses recyclable products inside the aircraft and in the lounges.

19. My preferred airline should sort and recycle its own plastic and aluminum waste.

20. I would like to fly with an environmentally friendly airline that supports green projects and research for the prevention of environmental pollution.

21. My preferred airline should share its environmental strategies and programs transparently with the public.

22. I don't pay much attention to environmental issues when buying plane tickets.

D. Voluntary Contribution to Environmental Activities

23. I make changes in my lifestyle to reduce the damage caused by humanity to the environment.

24. I may consider providing voluntary financial support to the airline's carbon emission (CO2) offsetting program when purchasing a ticket.

25. Implementing a waste reduction program increases ticket prices.

26. I may consider making a voluntary financial contribution to the airline's waste reduction program when purchasing tickets.

27. Knowing concretely the contribution of my airline to the environment will be effective in my decision to support environmental programs.

APPENDIX B

ETHICS COMMITTEE APPROVAL

Evrak Tarih ve Sayısı: 02/06/2020-327

İBN HALDUN ÜNİVERSİTESİ

T.C.
İBN HALDUN ÜNİVERSİTESİ
Sosyal ve Beşeri Bilimler Bilimsel Araştırma ve Yayın Etiği
Kurulu Başkanlığı

Sayı : 71395021-020-E.
Konu : Ali Tipi-Etik Kurul Kararı

İLGİLİ MAKAMA

Kurulumuza başvuran Ali Tipi'nin "Havayolu Yolcularının Havayollarının Sürdürülebilirlik Politikaları ve İş Modelleri Algısı: Türk Sivil Havacılık Pazarı Üzerine Bir Çalışma" isimli projesi; amaç, araştırma türü ve örneklem, veri toplama araçları, süreç ve işlemler, veri analizleri dikkate alınmak suretiyle 22.05.2020 tarihinde değerlendirilerek 2020/16-1 karar numarası ile etik açıdan uygun bulunmuştur.

Bilgilerinizi arz/rica ederim.

e-imzalıdır
Prof. Dr. Ali YEŞİLIRMAK
Başkan

CURRICULUM VITAE

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