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Comparison of Turkish Airlines and Aegean Airlines Loyalty Programs via Frequent Flyer Money Saver Analysis

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Abstract

Airline alliances work perfectly for paid flight segments, but there are difficulties for passengers who want to redeem frequent flyer miles. Most of the time, airlines decline to book requests for award mile seats to not only their partner airline customers but also their own customers. According to Elliot (2016), 630 million members are enrolled in different airline loyalty programs worldwide, but they lost 1 trillion award miles over the past five years. So, the global frequent flyer loyalty programs are not working as effectively as they once did.

To overcome the problems associated with redeeming award seats on flights, a more useful and effective system is necessary to fulfill passenger expectations. In this study, a new quantitative approach called Frequent Flyer Money Saver (FFMS) analysis was used to compare the loyalty programs of Turkish Airlines and Aegean Airlines. According to the results, increasing the number of reserved frequent flyer program seats on selected flights significantly increases savings from loyalty programs. Conversely, as the weekly frequency of flights between two destinations increases, savings from loyalty programs decrease.

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Keywords: Frequent flyer miles; Aviation credit cards; Award miles; Available seat

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1. Introduction

Since the deregulation of the airline industry, many airlines have started programs designed to encourage airline customers to accumulate frequent flyer program miles that can be redeemed for free air travel or other rewards. According to Elliot (2016), 630 million members are enrolled in 81 different airline loyalty programs (all members of Star Alliance, Sky Team and One World strategic alliances) worldwide, but they lost 1 trillion award miles over the past five years. Airline alliances work perfectly for paid flight segments, but there are difficulties for passengers who want to redeem frequent flyer miles. Most of the time, airlines decline to book requests for award mile seats to not only their partner airline customers but also their own customers. So, the global frequent flyer loyalty programs are not working as effectively as they once did. Vinod (2011) noted that "Loyalty is not just a program, but also a framework to reward and retain profitable customers to loyal repeat customers." Miles earned under frequent flyer loyalty programs may be based on the class of the fare, the distance flown on the airline or its partners, or the amount paid for the ticket. There are other ways to earn miles, as well. For example, in recent years, more miles have been earned using co-branded credit and debit cards than by air travel. Another way to earn points is by spending money at associated retail outlets, car rental companies, hotels, or other associated businesses. Points can be redeemed for air travel, other goods or services, or increased benefits (such as travel class upgrades, airport lounge access, fast-track access, or priority bookings). However, the most useful way of earning miles is using airline co-branded credit cards promoted by airline-bank partnerships. According to Turkish Airlines (2018), the airline give more than 1 trillion airline miles to airline and bank co-branded credit card holders during the year of 2017.

In this study, the frequent flyer loyalty programs of Turkish Airlines (Miles&Smiles) and Aegean Airlines (Miles&Bonus) were compared with regard to their program specifications that require a certain level of official credit card expenditures to fly free using one of the reserved seats for each particular plane type. The reason for selecting these two airline loyalty programs for this study is that both airlines operate from a single hub in the same geographic location. Istanbul's Ataturk International Airport (IST) is used as a hub by Turkish Airlines, and Athens International Airport (ATH) is the hub for Aegean Airlines. In addition, both of these airlines are members of the Star Alliance program.

This paper is organized as follows: Following Section 2's literature review, the information regarding the selection of airlines is given in the section 3. The empirical model and assumptions are discussed in Section 4. In Section 5, information about the data and summary statistics are given. The results are discussed in Section 6, and Section 7 concludes the paper.

2. Literature Review

The airline frequent flyer programs promise a great variety of free services. However, in reality, customers face problems utilizing these services. One problem is that, as the number of loyalty program members increases, the availability of certain awards diminishes, including free seats on flights. According to Brunger (2013), airline revenue management divisions view free seats reserved for frequent flyer customers as a liability, and therefore, the number of available award seats are limited. As a result, customers sometimes cannot fly free no matter how many frequent flyer miles they have earned. The situation gets worse when passengers need to book flights on partner airlines within their program's alliance. Most airlines prefer to reserve their higher-class free seats for their own frequent flyer program customers. Another problem related to frequent flyer programs is the exchange rate of frequent flyer miles to other services proposed by airline partner companies. According to Unsal (2018), if you want to use your miles to upgrade your tickets you will change 10.000 miles with 85$, but if you use your miles to purchase a good from a store you can exchange 10.000 miles with 5$. Dostov and Shust (2014) argued that no one is in charge of surveying frequent flyer mile transactions globally, and countries require different accounting models and have varying regulations for the way airlines convey their frequent flyer information to the public. However, most of the time, no one controls frequent flyer program mile earnings, and airline companies put in place whatever rules and regulations they think will maximize their shareholder benefits. Dostov and Shuts (2014) stated that "In reality, uncontrolled frequent flyer programs and exchange rates are a violation of customers' rights". You can see from Fig. 1 that most of the airline miles awarded by US airline frequent flyer program have never been redeemed, and passengers are not successful in getting seat upgrades using their airline miles.

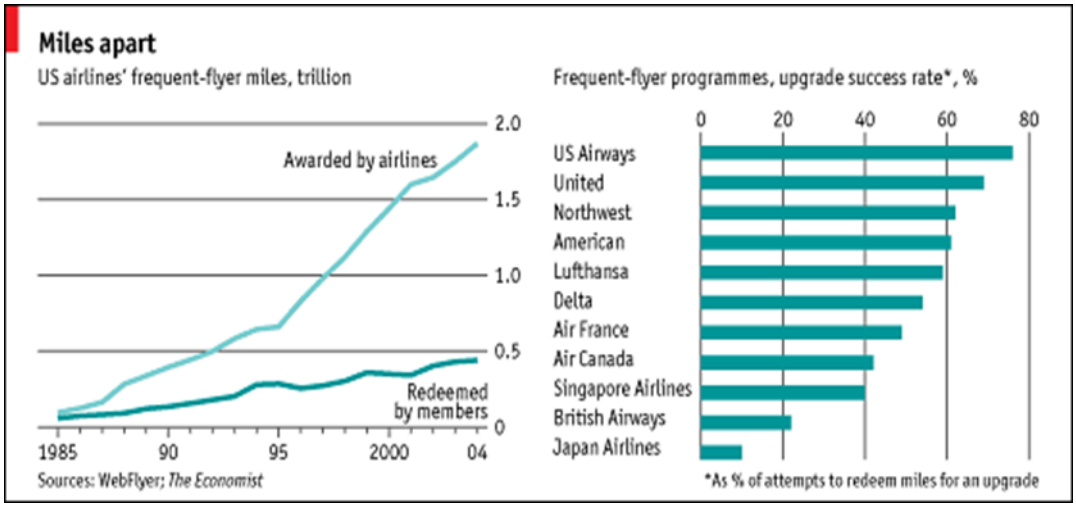

Fig. 1. Airline mile redemption chart.
Source: "Funny Money," The Economist (2005)

A majority of scholarly publications that are centered around the airline industry have focused on qualitative research about increasing customer loyalty for specific airlines by adopting frequent flyer programs. But there is a gap in the literature in that no studies thus far have focused on comparing different frequent flyer programs by analyzing savings related to official credit card expenditures. Not any quantitative study about how much money you can save from airline tickets when you use airline promoted credit cards have been done so far. It is unclear that if you spend 10.000 $ with the airline promoted credit card, you can have a ticket worth 100$ or 1000$? In marketing of airline co-branded credit cards, customers must be informed about how much they will be save when they are using these cards %5 or %40 to purchase a future airline ticket.

The contribution of this study to the existing literature is, therefore, that a new quantitative model was used to demonstrate the weakness in these airline loyalty programs, demonstrating why these airlines' customers cannot use their airline miles for award ticket redemptions more easily. The Frequent Flyer Money Saver (FFMS) analysis was first introduced by Unsal (2018), and in the first implementation of the FFMS analysis, the author included the level of difficulty in booking a free ticket as a variable in the formula. But the results of the study showed that the difficulty of booking had no significant effect on the FFMS ratio. Moreover, the difficulty level of booking is just based on personal experience of employees. It is not a scientifically collected data from a data set. So, it may cause obtaining wrong coefficients during the calculations. Therefore, in this study, this variable is omitted from the calculations. The major contribution of this paper to the existing literature is that the FFMS ratio is a unique tool that enables comparison of the savings ratio for airline tickets when we use airline–bank co-branded credit cards.

After comparing two different airline loyalty programs and investigating the factors in the calculations that affect the FFMS ratio, the FFMS study will be extended to include all commercial carriers under strategic airline alliances that also promote official credit cards.

2. Selection of Airlines

Aegean Airlines is the full-service flagship carrier of Greece. The carrier operates on an extensive domestic network and provides scheduled passenger services to international destinations in Europe, the Middle East, and Africa. Aegean also operates seasonal charter services to a significant number of Greek and international destinations. The carrier is a member of the Star Alliance and operates from its hub at ATH. In 2013, Aegean Airlines completed the acquisition of Olympic Air, and both carriers now operate as separate airline brands under the Aegean Airlines Group. According to CAPA (2018), the airline has 49 narrow-body aircraft in the fleet. According to the same statistics, Aegean Airlines ranked 137th for total number of seats and 153rd for weekly frequency globally in 2018. This airline has a loyalty program called Miles&Bonus, which allows members to

collect airline miles and book award seats on flights via the Miles&Bonus credit card offered by Alpha Bank.

Based at Istanbul (IST), Turkish Airlines is the national airline of Turkey and the country's largest carrier. Turkish Airlines operates a network of domestic and regional services throughout Turkey and the Middle East in addition to international services to Europe, Africa, North America, South America, and Asia. The carrier operates passenger services to over 270 destinations via IST and secondary hubs at Ankara's Esenboğa International Airport (ESB) and Adnan Menderes International Airport (ADB) in İzmir. According to CAPA (2018), the airline has 194 narrow-body and 103 wide-body aircraft in their fleet. According to the same statistics, Turkish Airlines ranked 10th for total number of seats and 11th for weekly frequency globally in 2018. This airline has a loyalty program called Miles&Smiles, which allows members to collect airline miles and book award seats on flights via the Miles&Smiles credit card offered by Garanti Bank (2018).

4. Mathematical Model

To overcome the problems associated with redeeming free seats on flights using frequent flyer miles, a new quantitative approach that enables comparison of the specifications for different aspects of frequent flyer loyalty programs is needed. In the current study, a new quantitative approach called the FFMS analysis was used to determine the factors that affect money-saving ratios when redeeming free flights with respect to official credit card expenditures. The Turkish Airlines Miles&Smiles and Aegean Airlines Miles&Bonus frequent flyer program specifications were used to conduct the quantitative study for this research.

The reasons behind the selection of the variables are, the available seats reserved for award mile redemption during the ticketed process is highly depended to the seat number reserved for each particular flight route. If there is no space reserved for frequent flyer mile redemptions, no matter the number of accumulated miles, passengers cannot travel freely. The weekly frequency also has a significant effect on the award ticket redemptions. As the frequency in a particular flight route increases, it increases the possibility of finding an available seat. On the contrary, the flight frequency has a negative correlation with the price of the flight tickets. As the frequency increases, the ticket prices fall. So, this variable is selected due to its significant effect on the FFMS ratio. Lastly, the flight distance has a significant effect during the calculation of required miles to travel with award miles during the flight. Turkish airlines require a standard number of miles regarding each geographical section of the world. On the contrary, Aegean requires a different number of miles to each different distance flown. As a result, all of three variables have selected due to their contributions on the calculation of FFMS ratio.

The mathematical model for the FFMS calculation is as follows:

$$FFMS\ Ratio = f\ (available\ seat, distance\ between\ cities, frequency\ of\ route) \quad (1)$$

$$(FFMS\ Ratio\ )_i = \frac{(Net\ Ticket\ Price)_i}{(Credit\ Card\ Expenditure)_i} = \beta_0 + \beta_1(distance\ between\ cities)_i + \beta_2(available\ seat)_i + \beta_3(route\ frequency)_i + u \quad (2)$$

where the dependent variable is the FFMS ratio, and the independent variables are
distance between cities = flying distance between two cities (in miles);
available seats = the number of seats reserved for mileage bookings;
route frequency = the number of flights between two cities each week;
credit card expenditure = the credit card expenditure required to get the selected ticket free;
net ticket price = the ticket price between two destinations (excluding taxes); and
u = the error term.

All of the quantitative data regarding credit card expenditures were obtained directly from the reservation section of the Turkish Airlines and Aegean Airlines websites. The credit card expenditure rates required to get award airline tickets were obtained from the websites of Garanti Bank (2018) and Alpha Bank (2018) (official bank partners of Turkish Airlines and Aegean Airlines, respectively). Ticket prices were obtained on 15 October 2018 for round-trip flights the third week of November. The route frequency indicates the number of total flights that particular week between the two selected cities, and the number of business class flights observed was less than economy flights because certain routes were served by planes with single-class cabin configurations.

The research questions in this study were (a) can people save a significant amount of money using frequent flyer

credit cards issued by an airline, such as in bank partnerships? (b) Do frequent flyer programs of different airlines provide different FFMS ratios? and (c) Is it possible to increase passenger traffic by changing the loyalty program specifications for the airlines? The hypotheses were the following:

H1: The airline FFMS ratio negatively correlates with the flying distance between two cities.

H2: The airline FFMS ratio positively correlates with the number of available seats reserved for frequent flyer customers.

H3: The airline FFMS ratio negatively correlates with the weekly frequency of flights between two cities.

After collection, the data were coded using SAS software (IBM Corp., Armonk, NY, US). The summary statistics were calculated, and the detailed results of the regression analyses are given in Section 6.

5. Data

The Turkish Airlines data contain information on round-trip tickets for 300 different departure points on Turkish Airlines flights, including on AnadoluJet (a trademark of Turkish Airlines). Data were obtained from the Turkish Airlines website (2018) on 15 October 2018 for round-trip tickets in the third week of November. For domestic flights, there were 76 flights originating from IST or Sabiha Gökçen International Airport (SAW) in Istanbul, ESB in Ankara, Yenişehir Airport (YEI) in Bursa, and Trabzon Airport (TZX) in Trabzon on flights operated by Turkish Airlines and AnadoluJet. For international flights, there were 224 flights originating from IST, SAW, and ESB. Airports in Istanbul serve 220 international routes per week, whereas the airport in Ankara serves just three international routes. The distribution of routes and flight data regarding destinations are shown in Table 1.

Table 1

Route and flight distribution for Turkish Airlines.

Destination	Number of routes	Percentage of routes	Number of flights	Percentage of flights
Domestic	76	25.3%	2,035	44.4%
Europe 1	27	9.0%	374	8.2%
Europe 2	78	26.0%	1,162	25.3%
Middle and North Africa	36	12.0%	245	5.3%
South Africa	7	2.3%	35	0.8%
Middle East	22	7.3%	354	7.7%
Middle Asia	15	5.0%	109	2.4%
Far East	19	6.3%	134	2.9%
North America	12	4.0%	85	1.9%
South America	5	1.7%	19	0.4%
Oceania	3	1.0%	35	0.8%
Total	300	100.0%	4,587	100.0%

The summary statistics for the merged data calculated in SAS are shown in Table 2.

Table 2

Summary statistics for Turkish Airlines.

Variables	N	Mean	Std dev	Minimum	Maximum
Distance between two cities (miles)	4,58	1,849.16	1,849.2	148.00	10,587.00
Ticket price, economy – USD	4,58	280.75	372.55	1.11	2,685.83
Ticket price, business – USD	4,11	1,546.28	1,280.2	202.77	6,220.56
Available seats – economy	4,58	80.47	114.28	2.00	1,200.00
Available seats – business	4,11	71.32	102.69	2.00	985.00
Weekly frequency	4,58	15.29	22.91	2.00	240.00
Required credit card expenditure for	4,58	6,643.52	5,069.7	2,083.33	22,222.22

economy class flights – USD					
Required credit card expenditure for business class flights – USD	4,11	10,983.40	7,070.8	3,472.22	30,555.56
FFMS for economy flights	4,58	3.4%	3.5%	0.5%	22.4%
FFMS for business flights	4,11	12.91%	6.3%	4.7%	41.0%

There are fewer observations of business class flights than economy class flights because some of the routes are served by planes with single-class cabin configurations. The FFMS ratio for business class is greater than that for economy class due to higher ticket prices, and because the cabin size on business class flights is limited, there are fewer available seats reserved for award tickets in this class than with economy class.

The Aegean Airlines data (2018) contain flights for round-trip tickets from 84 different departure points on Aegean Airlines flights, including Olympic Air (a trademark of Aegean Airlines). Data were obtained from the Aegean Airlines website (2018) on 15 October 2018 for the third week of November. Domestic flights amounted to 28 destinations, all originating from ATH and operated by Olympic Air. Also originating from ATH were 56 international flights. The summary statistics for the merged data were calculated in SAS and are shown in Table 3.

Table 3
Summary statistics for Aegean Airlines.

Variables	N	Mean	Std dev	Minimum	Maximum
Distance between two cities (in miles)	886	764.33	538.37	78.00	1,813.00
Ticket price, economy – USD	886	211.16	146.88	43.70	673.90
Ticket price, business – USD	683	505.23	208.94	164.45	934.95
Available seats – economy	886	52.73	60.43	5.00	350.00
Available seats – business	683	66.96	71.77	5.00	350.00
Weekly frequency	886	10.54	12.08	1.00	70.00
Required credit card expenditure for economy class flights – USD	886	2,846.89	847.52	2,083.33	5,036.11
Required credit card expenditure for business class flights – USD	683	4,792.40	1,190.6	2,777.78	7,470.83
FFMS for economy flights	886	6.0%	3.27%	1.82%	16.39%
FFMS for business flights	683	9.0%	2.71%	5.14%	17.44%

6. Results

In the first regression, calculations were made for economy class flights, and in the second regression, calculations were made for business class flights. After running the regression model for Turkish Airlines, the results were not significant at the 1% level, and the coefficients had different signs. According to the R-squared, our model explains approximately 24% of economy class flights and 14% of business class flights. Therefore, our regression may be faulty in the presence of heteroskedasticity among the independent variables, meaning that the regression must be tested for heteroskedasticity. According to the White test for heteroskedasticity, as described by Wooldridge (2016), both of our coefficients for the FFMS ratio hat and the FFMS ratio hat squared are significantly different from zero, at a 1% level of significance. The F-statistics were too high at 550 for economy class and 207 for business class and significance at 1%. Thus, the null hypothesis about homoskedasticity is rejected, and there is heteroskedasticity among the variables in our original model that need to be corrected. For the correction of heteroskedasticity in the model, the weighted least squares estimation technique described by Wooldridge (2016) was used, and the results of the weighted least squares model are given in Table 4.

Table 4
Regression results for Turkish Airlines.
*** Indicates significance at 1% level.

Dependent variable	**FFMS for economy flights**	**FFMS for business flights**
Independent variables	***Regression for economy flights*** ***Parameter estimate (standard error)***	***Regression for business flights*** ***Parameter estimate (standard error)***
N (Number of observations)	4,587	4,112
$\widehat{\beta_0}$ (Intercept)	−0.09954*** (0.00274)	−0.1942*** (0.0062)
$\widehat{\beta_1}$ (Coefficient of distance between two cities)	−0.00001200*** (0.00000148)	−0.00001011*** (0.00000258)
$\widehat{\beta_2}$ (Coefficient of available seats)	0.00092770*** (0.00011698)	0.00061491*** (0.00017601)
$\widehat{\beta_3}$ (Coefficient of weekly frequency)	−0.0045000*** (0.00059188)	−0.00209*** (0.00076)
R^2	0.9402	0.9244
F-statistic	31.18***	14.56***

H1: $\widehat{\beta_1}$ is the coefficient of distance between two cities. It is negative at the 1% level and significant for both classes of travel.

The further the distance traveled, the lower the FFMS ratio will be for both classes of travel.

H2: $\widehat{\beta_2}$ is the coefficient of available seats. It is positive at the 1% level and significant for both classes of travel.

This means that the greater the number of available seats, the higher the FFMS ratio will be.

H3: $\widehat{\beta_3}$ is the coefficient of weekly frequency. It is negative at the 1% level and significant for both classes of travel.

This means that the greater the weekly frequency of flights, the lower the FFMS ratio will be. If a route has a frequency of multiple trips, it means there are more passengers demanding that route, so the savings for both classes of travel are lower.

According to the White test for heteroskedasticity with the Aegean Airlines regressions, our coefficients for both the FFMS ratio hat and the FFMS ratio hat squared were significantly different from zero, at a 1% level of significance. The F-statistics are too high at 64 for economy class and 25 for business class with significance at the 1% level. Thus, the null hypothesis about homoskedasticity is rejected. Because there was heteroskedasticity among the variables in our original model, we needed to correct it. For the correction of the heteroskedasticity in the model, the weighted least squares estimation technique was used, and the corrected results of the weighted least squares model are given in Table 5.

Table 5
Regression results for Aegean Airlines.

Dependent variable	**FFMS for economy flights**	**FFMS for business flights**
Independent variables	***Regression for economy flights*** ***Parameter estimate (standard error)***	***Regression for business flights*** ***Parameter estimate (standard error)***
N (Number of observations)	886	683
$\widehat{\beta_0}$ (Intercept)	−0.09547*** (0.00486)	−0.12200*** (0.01304)
$\widehat{\beta_1}$ (Coefficient of distance between two cities)	−0.00003417*** (0.00000560)	Not Significant
$\widehat{\beta_2}$ (Coefficient of available seats)	0.00019933*** (0.00002002)	0.00026063*** (0.00004097)
$\widehat{\beta_3}$ (Coefficient of weekly	Not significant	Not significant

frequency)		
R^2	0.9527	0.9381
F-statistic	18.26***	3.60***

*** Indicates significance at 1% level.

We can summarize the test results as follows:

H1: $\widehat{\beta_1}$ is the coefficient of distance between two cities. It is negative at the 1% level and significant for economy class but not significant for business class.

The greater the distance traveled, the lower the FFMS ratio will be for economy class. The required number of miles to get an award ticket on longer routes, in particular, is three to four times higher than shorter routes, So, for economy class, the FFMS ratio will decrease when traveling farther.

H2: $\widehat{\beta_2}$ is the coefficient of available seats. It is positive at the 1% level and significant for both classes of travel. This means that the more seats that are available, the higher the FFMS ratio will be.

H3: $\widehat{\beta_3}$ is the coefficient of weekly frequency. It is significant at the 1% level and negative for economy class. However, it is not significant for business class.

This means that the more frequent there are flights for a route per week, the lower the FFMS ratio will be. The weekly frequency is very high for relatively close international routes (flight time less than two hours). These routes are served multiple times every day, so the average ticket price for each particular flight is lower than for other international routes. Thus, the reason the FFMS ratio is negative is due to lower demand.

A comparison of different frequent flyer program specifications for Turkish Airlines and Aegean Airlines is given in Fig. 2.

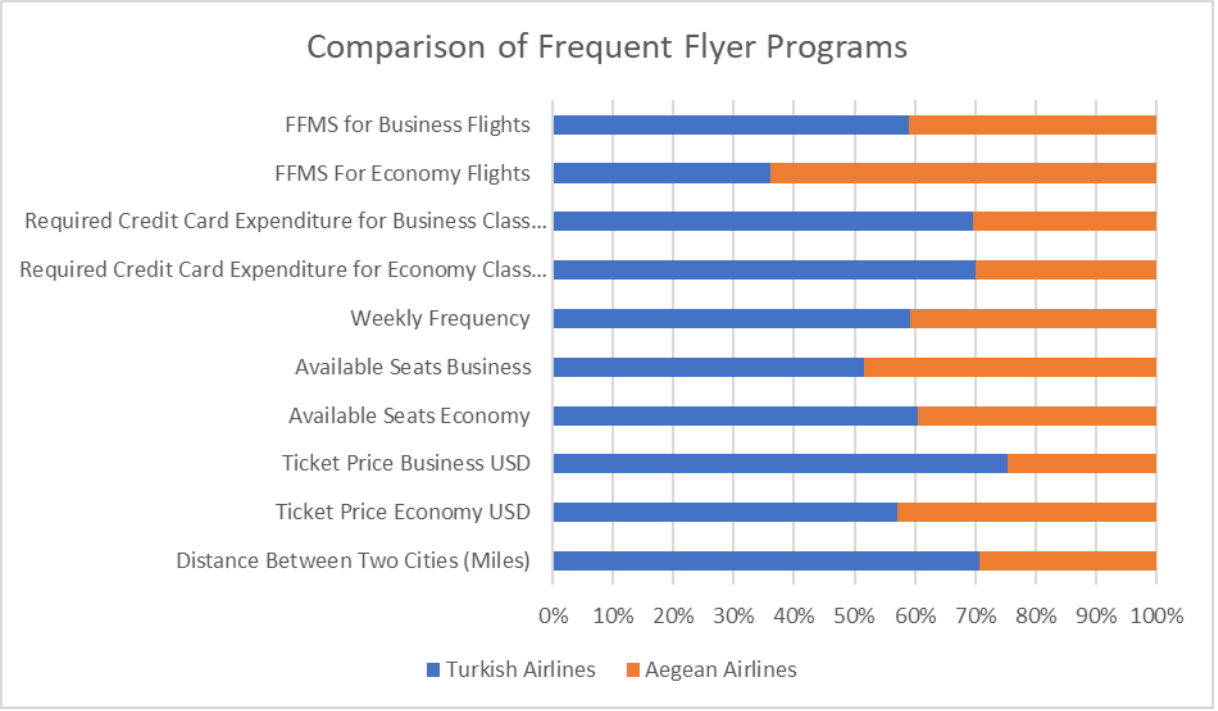

Fig. 2. Frequent flyer program comparison via FFMS analysis.

The comparisons of the multiple regression results for Turkish Airlines and Aegean Airlines economy class and business class are given in Fig. 3 and Fig. 4, respectively.

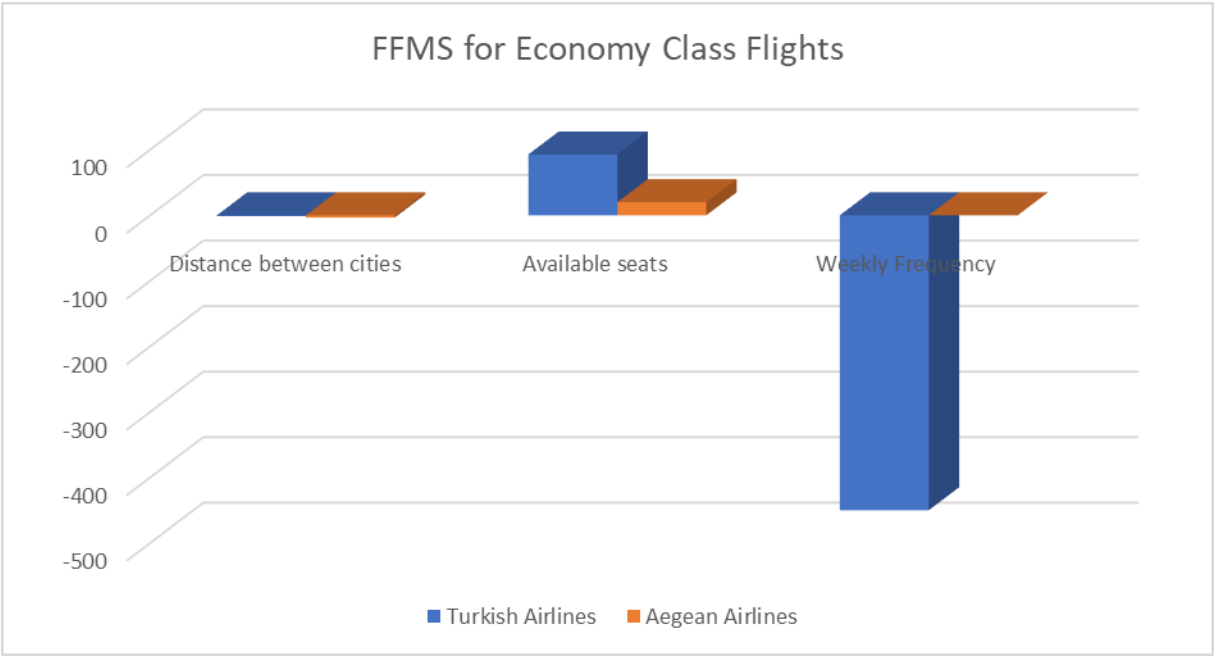

Fig. 3. Comparison of multiple regression results – economy class.

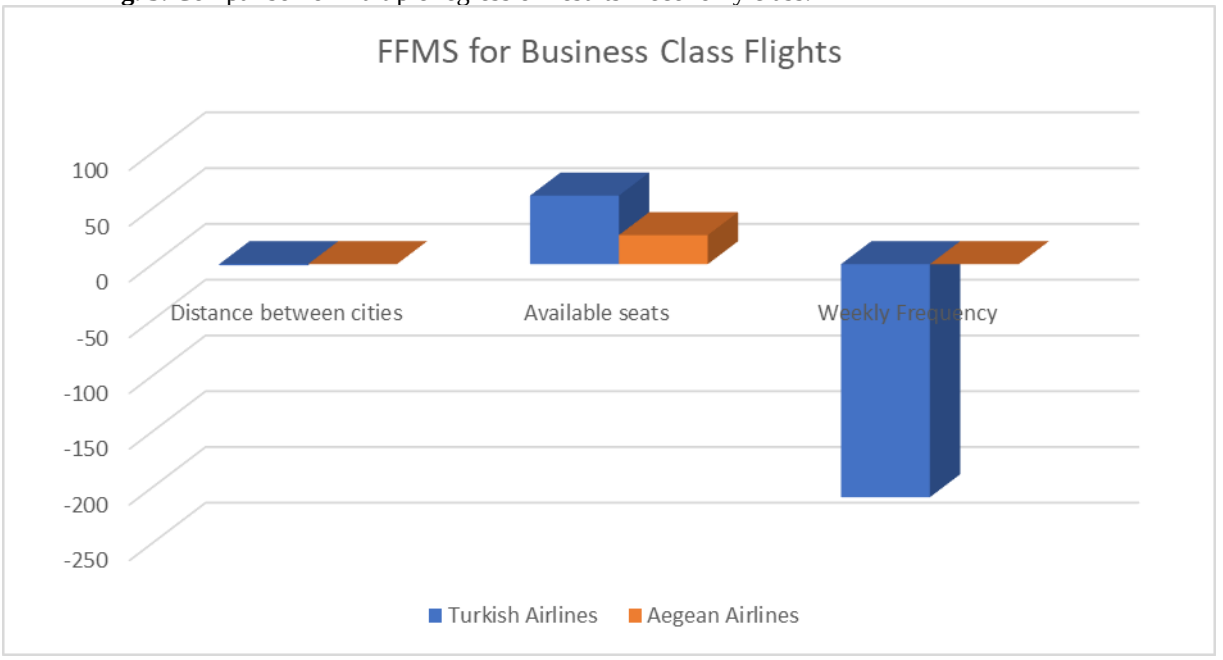

Fig. 4. Comparison of multiple regression results – business class.

According to the R-squared results obtained during the calculations, our model helps explain more than 92% of the variables in the study. Therefore, all of our calculations are valid.

According to the obtained results, the FFMS ratio in economy class is higher for Aegean Airlines; however, the FFMS ratio in business class is higher for Turkish Airlines.

The reason for this is that Aegean Airlines offers better prices for economy class on European routes.

Regarding the required credit card expenditures, Aegean Airlines offers an option that is at least 20% better than Turkish Airlines, meaning that passengers have to spend 20% less before eligibility to travel free in either class.

The effect of weekly frequency is negative for Turkish Airlines flights. The price of an economy class ticket is lower than a business class ticket, and this is the primary reason for the higher coefficient on business class flights. As the weekly frequency increases, the availability of cheaper tickets also increases for both classes of travel.

These findings indicate that in order to increase passenger satisfaction with increasing the issued award ticket numbers more from loyalty programs, Aegean Airlines needs to increase the number of available seats on flights. They could consider purchasing more wide-body aircraft or increasing the number of routes (but not frequency). Turkish Airlines needs to lower the miles required for travel with award miles significantly, although the weekly frequency and number of seats allocated are sufficient.

7. Conclusion

This paper utilizes the new quantitative tool of the FFMS analysis to examine changes in the FFMS ratio for Turkish Airlines and Aegean Airlines flights that are explained by the desired traveling distance between two cities, the number of available seats for award tickets, and weekly flight frequency. The FFMS analyzing tool helps us understand the factors affecting award mile seat demand on Turkish Airlines and Aegean Airlines flights. Our calculations revealed that the FFMS ratio is highly correlated with demand for a particular flight. The reason behind this is that the airlines are using a dynamic pricing algorithm.

Data regarding FFMS calculations were obtained directly from airline reservation websites for a round-trip ticket the third week of November 2018, and the observations included all flight pricing information for the specified week. The FFMS ratios were calculated from the obtained data, and several multiple regressions were conducted using SAS statistical analysis software.

After the regressions, all variables except the weekly frequency on Aegean Airlines were significant for economy class flights, at 1%. According to these results, the FFMS ratio for economy class is higher for Aegean Airlines; however, the FFMS ratio for business class is higher on Turkish Airlines. This is because Aegean Airlines offers better prices for economy class on European routes, but Aegean does not operate long-haul flights in either economy or business class. The required level of credit card expenditure to obtain an award ticket is significantly higher for Turkish Airlines, and the reason for the result of a negative coefficient with weekly frequency is that, as the daily frequency increases, the price of tickets lowers, which causes a reduction in the FFMS ratio.

With regard to business class flights, weekly frequency and the distance between two cities were not significant for Aegean Airlines. This is because the flight schedule for Aegean Airlines is relatively small and stable in comparison to Turkish Airlines. Most of the flights on Aegean Airlines are short-haul flights that take under two hours, and most of these flights were operated once a day during the observation period. The result of a negative coefficient for weekly frequency and distance with Turkish Airlines can be explained by the fact that, as flight routes go farther distances, the number of required miles to buy an award ticket becomes three to four times greater than for shorter routes. Flights in business class are extremely expensive, and it is quite difficult to find available seats on these aircraft. For example, Singapore Airlines award tickets were generally sold out approximately 11 months before departure date. So it is reasonable to receive a negative coefficient from the model regarding travel distance.

In order to increase passenger satisfaction from loyalty programs, Aegean Airlines needs to increase the number of available seats on flights via the acquisition of more wide-body aircraft or an increase in the number of routes. With regard to Turkish Airlines, they need to lower the required miles to travel using award miles by at least 20% in order to compete with Aegean's loyalty program.

8. Further Study

One extension of this research will be to analyze all flag carrier commercial aviation companies under strategic airline alliances that also promote their official credit cards. This will allow for comparison of all the frequent flyer programs simultaneously. Such a comparison could help airlines to redesign their loyalty program specifications so that passengers would be able to collect and redeem their frequent flyer miles more easily. If the airlines want to increase passenger demand and loyalty, they need to increase their overall service quality, and if they successfully

adopt this strategy, it could boost business volume for the aviation industry significantly.

Additionally, the FFMS analysis tool can be used to analyze the loyalty programs of international cruise ship companies. The cabin marketing and pricing strategies of cruise ships are similar to aviation seat marketing, and most of the cruise companies are already promoting their official credit cards, making it possible to compare the specifications of cruise ship loyalty programs using the FFMS analysis.

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