ASSESSING AIRLINES: QUALITY AS A COMPETITIVE VARIABLE

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Abstract

Price is no longer the sole variable affecting consumer choice in the airline sector. Service quality, which has been analyzed from a range of perspectives, is of increasing importance in this market. Airlines provide a *transportation service* (typically for purposes of tourism) and so analyzing passenger assessments has become crucial in this competitive industry. This paper seeks to determine the factors that account for airline passengers' perceptions of the quality of service they receive. Drawing on data from a survey of more than 35 airlines worldwide in two years, we find that perceived quality increases for larger companies that concentrate their operations on a few routes. Regional airlines receive the worst assessments, while we find no marked differences between low-cost and network airlines. The weak financial conditions of a company are also found to reduce the perceived quality of the airline.

Keywords: Perceived quality; Airlines; Tourism

JEL Codes: L83, L93

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1. Introduction

The highly competitive market conditions that characterize the airline industry place airlines under great pressure to deliver high-quality services (Pakdil and Aydin, 2007). This increasing competition is reflected in such aspects as price, as a growing number of companies offer their services on a specific route. In particular, the emergence of low-cost carriers (LCC) has forced network airlines to redefine their strategies as they seek to retain their market shares (see, for example, Fageda et al., 2011).

Yet, price is not the sole source of competition among airlines. In a market where price competition is fierce, service quality emerges as a competitive variable. This distinction supposes that while some companies focus on supplying low prices, others focus on supplying high quality services.

At the same time, it should not be forgotten that airlines offer a *transportation service* conveying passengers from their point of origin to that of their destination. As with any service provider, customer assessments are essential in upholding the company image and, ultimately, sustaining their business. Customers' journeys are motivated by two main purposes: business (work motives) or pleasure (tourist activities). The former involves companies satisfying high-quality demand, while the latter involves the provision of quality to satisfy the customers' travel experience.

However, in the airline industry, quality is a multifaceted concept comprising all the characteristics that make up the passengers' perceptions of their travel experience. From the moment a passenger steps foot in the airport terminal until she leaves the arrival airport, there are a myriad of elements that can affect her perception of airline quality: the time at which the flight can be taken, the check-in experience, the "baggaging" system, the aircraft, the reliability of the cabin crew, the punctuality of take-off, on board comfort, other staffing issues, price-quality ratio, overall efficiency, etc. Each of these factors has a bearing on passenger assessment of an airline and companies seeking to provide high quality services cannot afford to lose sight of this fact.

However, it might be the case that these characteristics are closely associated with the specific nature of the operational and organizational models adopted by airlines. Thus, here, we seek to determine whether, for example, being a large operator, being an alliance member or a regional company influences passenger assessments of airline companies.

In this paper, we therefore examine the factors that explain evaluations of airline quality. More specifically, we analyze the relationship between quality perception of an airline company and variables of operator size, the number of airports from which a company operates, the business model adopted (network, low-cost, regional) and the financial conditions of the airline.

The paper is structured as follows: in section 2, a short review is undertaken of studies of quality assessment in the airline sector. Section 3 outlines the methods of data collection adopted and the empirical strategy employed. We also present our descriptive statistics. Estimation results are detailed in section 4. Finally, our main conclusions are drawn in section 5.

2. Literature review

The dimensions of quality and their assessment have been examined in depth by both the management and economics literature, above all among service providers (Akan, 1995). However, as Liou et al. (2011) claim "there is no universal and exact definition of service quality; the concept of service quality is context-dependent. Its measurements should thus reflect the operational environment being investigated."

In this paper, we are interested primarily in airline service quality and the analyses undertaken to date in this sector. A number of studies show service quality to be essential in passenger choice (Bureau of Transport and Communications Economics, 1994; Pakdl and Aydin, 2007). Indeed, Sim et al. (2006) established a descriptive statistical relationship between the influence of service quality and aircraft productivity on a firm's future performance, concluding that lower service quality indicators are associated with a lower return on assets and on sales.

Elsewhere, empirical studies have been conducted by Gursoy et al. (2005), for example, in which the relative positioning of the ten major US airlines is considered based on service attributes that influence consumer perceptions. The study, which draws on data from the Air Travel Consumer Report published by the US Department of Transportation, reflects the importance of features such as on-time performance, involuntary denied boarding, mishandled baggage and 12 customer complaint areas.

Along the same line, Gilbert and Wong (2003) developed a questionnaire to evaluate passenger expectations regarding various dimensions that impact on perceived quality, focusing on passenger characteristics and the influence of these on their expectations.

"Assurance" was found to be the most important service dimension. Other studies of passenger assessments include Elliot and Roach (1993), who evaluate airline service quality using on-time performance, baggage handling, food quality, seat comfort, and other criteria; and Aksoy et al. (2003), who explore differences in the consumer expectations of domestic and foreign passengers on airline services in Turkey.

Likewise, Pakdl and Aydin (2007) show how company "responsiveness" (baggage, delays, etc.) is one of the key dimensions of perceived quality. In their analysis, the authors conclude that education levels affect passenger valuations, and that each passenger should be considered unique and independent of all others.

In relation to our issue, there are other relevant points to be considered. Chang and Yang (2008) analyzed airlines' brand niches through measuring passengers' repurchase motivation, considering the impact of a range of variables that included flight frequencies, security, price, aircraft characteristics and service quality. They used data from four airlines that link Taipei and Hong Kong. Their results indicate that each airline chooses a specific quality strategy for competing in this particular corridor.

One of the other lines of research in service quality in the sector has been conducted in strategic alliance settings. The relevance is obvious if we consider that "negative perceptions of one member airline may have negative implications for the entire alliance" (Weber and Sparks, 2004). Weber (2005) assessed the importance of air travelers' perceptions of airline alliance (including, STAR and ONEWORLD) benefits and performance. Based on a survey conducted at Hong Kong International Airport, the study found significant differences in perceptions between residents of Western and Asian countries which has led global alliances to adopt different approaches to different market segments. The study concludes that factors affecting traveler convenience are more important in alliances than the ability to earn frequent flyer points or the provision of an extensive route network.

Similarly, Tiernan et al. (2008) undertook an analysis of international alliances in Europe and the USA to determine whether they are likely to succumb to low cost practices or whether they will continue to adhere to quality policies to distinguish them from their competitors. They conclude that service quality is the main attraction for passengers when choosing to fly with an alliance member.

In our analysis, we seek to shed further light on the relationship between alliance membership and obtaining a better evaluation from passengers in terms of perceived quality in a worldwide context.

Additionally, experiencing financial difficulties or the effects of a period of economic crisis may be factors that can impact passenger assessments of airlines. Borenstein and Rose (2003) found that airline bankruptcies reduce service provisions at some airports (most notably at midsize airports), refuting the idea that bankruptcy might stimulate the expansion of other companies as they seek to replace flights no longer being offered. However, no relationship was established between airline service quality and financial difficulties. This relationship is further tested in this paper.

Thus, while the literature has analyzed in depth the impact on service quality of specific characteristics such as performance, delays, baggage handling, etc. (Gursoy et al., 2005; Chang and Yang, 2008; Elliot and Roach, 1993; Pakdl and Aydin, 2007), no single study, to the best of our knowledge, has sought to relate air traveler perceptions with airlines' general operational and organizational features. Here, therefore, we are specifically interested in determining whether perceptions are affected by the fact that a company uses regional aircraft, by its nationality or by its size (measured in terms of the number of seats it makes available and the number of airports from which it operates), in addition to the aforementioned factors of being an alliance member and the experiencing of financial problems. In this paper, drawing on survey data (employing a Likert scale), we examine whether type, operational and organizational characteristics as well as the financial structure of an airline are drivers of passenger valuations.

3. Data and empirical strategy

We constructed a database comprising information for several airlines in the two years available (2006 and 2009). We drew on various sources to gather data about the factors that might influence passenger assessments. In this sense, our endogenous variable is airline quality as perceived by consumers.

Passenger assessments of airlines were obtained from a survey conducted among 8,638 passengers on 110 airlines (regional, national and international companies) by the Organization of Consumers and Users of Spain (OCU) together with other European User Associations in 2006 and 2009.

The airlines included in the survey operate at airports around the world. A cumulative analysis shows that ninety per cent of the companies operate from at least 30 different airports. European airlines constitute 61 per cent of the sample.

The OCU uses a perceived quality index for each year based on the following parameters that seek to measure an airline's operational environment: reliability, punctuality, comfort, staff, price-quality ratio, baggage handling and efficiency. We then use the score obtained by each company as our endogenous variable in an effort to identify the factors that influence it. Our hypothesis is that various attributes of airline companies impact on these variables of the operational environment and our goal is to identify what these attributes might be. Specifically, we examine the impact of such attributes as size, business model, financial condition, and nationality on consumers' perceived quality.

The most highly ranked by customers in terms of service quality are the Asian and Mid-East airline companies (82.9 and 86.3 respectively); at the bottom of the ranking, we find various South American airlines. Regards to type of airline, low cost airlines are the less valued (74 average; minimum equal to 66). Moreover, average data on quality perceived shows that airlines included in an alliance are a factor that increases it. While companies in an alliance reach 74.1, other companies are situated at 72.1 average values.[2]

After this exploratory analysis of data, our empirical multivariate analysis is based on the estimation of the following equation for the perceived quality of airline i in year t:

$$\begin{aligned}
\text{Quality}_{it} = \alpha_0 &+ \alpha_1 \text{Seat Km}_{it} + \alpha_2 Nairports_{it} + \alpha_3 Ltdebt_{it} \\
&+ \alpha_4 D_i^{Regional\ Airline} + \alpha_5 D_i^{Alliance} + \alpha_6 D_i^{EU} + \alpha_7 D_i^{Year} + \varepsilon_{it}
\end{aligned} \tag{1}$$

The explanatory variables included in the estimation of the quality equation are the following:

1. *Seat Km$_{it}$*.- Available seat kilometers for airline i in period t. This variable seeks to capture an airline's overall activity, i.e., its total supply. Data for this variable were obtained from the traffic statistics of the International Civil Aviation Organization (ICAO).

We would expect a higher perceived quality for larger airline companies as passenger knowledge of the brand can be assumed to be greater. Furthermore, larger airlines can

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[2] Both means results have been tested by a *t*-test mean comparisons. They are significant at 1 per cent in those differences.

typically provide better services in terms of frequent flyer programs, flight schedules and airport access (Borenstein, 1989; Berry et al., 1996). Importantly, larger airlines are also able to offer higher flight frequencies on the routes that they operate. Flight frequency is a key quality attribute among business passengers since it determines the schedule delay cost (i.e., the difference between the actual and the desired time of departure).

2. *$Nairports_{it}$*.- Number of airports from which airline *i* operates in year *t*. This variable was obtained from the *RDC Aviation* web page (capstats). As with the seats variable, we expect a higher perceived quality for airlines operating from a higher number of airports. Their brand is also more likely to be known among potential passengers wishing to use their services. However, an airline with a high number of available seat kilometers does not necessarily operate from a higher number of airports (in fact, the correlation between the two variables in our sample is just 0.16).

3. *$Ltdebt_{it}$*.- Long-Term Debt of airline *i* in year *t*. Data for this variable were obtained from the financial statistics of the International Civil Aviation Organization (ICAO). A priori, we would expect airlines whose overall financial condition is weak to have more incentives to save costs. An obvious strategy for saving costs among airlines is to reduce the service quality offered to passengers in all aspects deemed non-essential.

4. $D_i^{Regional\ Airline}$.- A binary variable that takes a value of 1 if the observation *i* corresponds to a regional airline, i.e., those that employ regional aircraft (regional jets, turboprops and the like). While several regional carriers are subsidiaries of network airlines (airlines involved in alliances) or have franchise agreements with them, others, such as Aer Aran and Binter Canarias, are now independent.

A priori, the expected sign of this variable is unclear. Regional carriers may, on the one hand, offer greater flight frequencies given the number of available seats, but, on the other, flight comfort, in terms of cabin space, noise levels, cruising speed, exposure to turbulence, etc., on regional aircraft is not as great as that on mainline jets. This is especially true of turboprop aircraft. US regional airlines have largely renewed their fleet of regional aircraft, replacing turboprops with regional jets, while European carriers still tend to use turboprops (Fageda and Flores-Fillol, forthcoming). Note that regional carriers typically operate on very short-haul routes so that most of the regional carriers in our sample are from Europe.

5. $D_i^{Alliance}$.- A binary variable that takes a value of 1 if the observation *i* corresponds to an airline included in an airline alliance such as Oneworld, Star or SkyTeam. We expect a positive sign for this variable (as service quality is the main attraction when choosing to fly with an alliance member, Tiernan et al, 2008). Overall, airlines that are members of

alliances can be expected to offer a better service than that provided by low-cost carriers. A key difference between the two is that network airlines (i.e., those involved in alliances) offer different classes of airfare while low-cost carriers have just a single fare class. As such, network airlines differentiate between business and tourist passengers and so the perceived quality for business passengers should be markedly higher. When controlling for the size of the airline, it becomes less clear for tourist passengers that network airlines offer high quality services given the marked degree of convergence in the business models operated by these two airline types (no-frills on board, dense seating configuration, baggage fees and so on).

6. D_i^{EU}.- A binary variable that takes a value of 1 if the observation i corresponds to an airline located in the European Union. A priori, we would expect a positive sign for this variable as our sample is based on a survey of passengers flying from European airports. As a large proportion of passengers in our sample will be European, non-European airline brands will not be so well known to them.

7. D_i^{year}.- A dummy variable that takes the value of 1 for 2009. Recall that we have data for 2006 and 2009. This variable allows us to examine whether the perceived quality has improved or worsened between the two dates. Note that the economic difficulties faced by most countries in 2009, especially in comparison with 2006, may influence the result for this variable.

Table 1 includes the descriptive statistics for the variables used in the empirical analysis. We have 75 observations for almost each variable (with the exception of "number of airports" and "long-term debt"). The mean value of the quality indicator is 75.1, with a range of 25 points. Regional airlines represent three per cent of our sample, while 71 per cent of airlines are members of an alliance. The average airline offers 65 million seat kilometers and operates from 16 different airports. The average long-term debt is 2,260 million of current dollars, and almost fifty per cent of the airlines are European.

Insert Table 1 about here

4. Results

Table 2 shows the results of the estimation of the equation for the factors driving the perceived quality of airlines. We used Ordinary Least Squares regression to estimate the equation with standard errors robust to heteroskedasticity. We estimated different specifications of the equation as we have fewer observations for two of the variables (number of airports from where each airline operates and long-term debt). Thus, we first

estimated the equation excluding these two variables. In this regression, we included 75 observations. We then estimated the equation including the number of airports variable and our sample was reduced to 68 observations. Finally, we included all the variables and the sample included just 41 observations.

Insert Table 2 about here

We found the perceived quality of larger airlines to be higher. Indeed, the coefficient associated with the number of seats variable is positive and statistically significant in each of the three regressions estimated. Note that larger airlines can exploit density economies derived from carrying more passengers on the routes on which they operate, since they can fly larger aircrafts at higher load factors. Overall, the influence of density economies is more closely associated with the traffic on the route, but larger airlines are likely to offer more seats on the routes on which they operate. Thus, the competitive advantage enjoyed by larger airlines may be related to both higher perceived quality and lower costs.

By contrast, the number of airports from which airlines operate does not seem to influence perceived quality. In fact, the variable is not statistically significant (and is actually negative and statistically significant at the 10% level). Thus, it seems that airlines should concentrate traffic in a small number of airports because this might enable them to exploit density economies and avoid their being affected by poor quality perception.

As expected, airlines with weaker financial conditions are perceived as offering lower service quality. Indeed, the coefficient associated with the long-term debt variable is negative and statistically significant at the 10% level. Likewise, the dummy variable that takes a value of 1 for 2009 (a year characterized by a severe financial crisis) is also negative and statistically significant at the 5% and 1% levels (depending on the model considered). Thus, it would appear that airlines adjust service quality when experiencing financial difficulties.

We find that the perceived quality of European airlines is not as high as that of their non-European counterparts; however, the coefficient associated with this variable is not statistically significant. The airline sector is a strongly globalized industry and, today, it would seem that European passengers have a good knowledge of most American and Asian airlines. This is important since passengers might benefit from stronger competition between European and non-European airlines.

As for the business models operated by the airlines, we find that the perceived quality of regional carriers is not as high as that of airlines using mainline jets. The obvious

implication of this result is that regional carriers in Europe could benefit from adopting regional jet technology. Indeed, the comfort afforded by regional jets is comparable to that provided by mainline jets. However, European airlines still tend to use turboprop aircraft on short-haul routes (see Fageda and Flores-Fillol, 2012, for a further explanation of this debate).

When controlling for the size of the airline, we find no differences in the perceived quality of network and low-cost carriers, which in part accounts for the fierce competition between these two types of airline. Low-cost airlines are able to exploit several cost advantages in relation to network airlines and this does not seem to condition their passengers' perceptions of quality. Hence, large low-cost carriers, such as Ryanair and Easyjet in Europe and Southwest in US, are able to compete with traditional carriers not just in costs but also in perceived levels of quality. This has important implications in terms of competition.

5. Conclusions and discussion

Current market conditions in the airline industry have led some companies to redefine their strategies so as to retain (or expand) their respective market shares. A number of airlines have opted to enhance the quality of their service rather than engage in a price war. Given that airlines operate in a service industry, quality is a key factor and passenger assessments cannot be ignored. Indeed, airlines form part of the travel experience and travelers can be particularly affected by their perceptions of quality; in other words, their travel experience can be considered as commencing at the departure airport (or even before).

In this paper, we have sought to shed some light on what might underpin passenger assessments of airline companies. As noted, our analysis suggests that user assessments of the check-in experience, aircraft, cabin crew reliability, punctuality and comfort, among others, may ultimately be determined by various organizational, operational and financial features.

Our examination of these operational and organizational characteristics shows that larger airlines have a higher perceived quality. This, together with the existence of density economies, gives a competitive advantage to the larger airlines. We also show that the dispersion of an airline's traffic among different airports is not a significant variable, and may in fact have a negative impact on assessments of perceived quality: in other words,

concentrating traffic in just a few airports could be better in terms of quality and allow airlines to benefit from density economies as well.

The perceived quality of regional carriers is not as high as that of airlines using mainline jets. As such, Europe's regional carriers could benefit from the advantages of adopting regional jet technology, especially given that European airlines have poorer assessment scores than American and Asian airlines.

Our examination of financial characteristics reveals interesting findings: namely, that the financial conditions of an airline affect users' perceptions of quality. Moreover, it seems that the economic crisis has served to undermine passenger assessments of quality further as airlines seek to adjust the quality of service offered to passengers as a cost cutting measure.

Based on our results, regions that seek to promote activity in their airports should attempt to attract large airlines. These airlines may be able to operate with lower costs due to the exploitation of density economies. Furthermore, the service that they offer seems to be attractive for passengers regardless of whether they are network or low-cost airlines.

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TABLES

Table 1. Descriptive statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
Quality	75	75.12	6.62	63	88
Regional airline	75	0.03	-	0	1
Alliance	75	0.71	-	0	1
Seat Kilometers Available	75	6.5 e7	6.7 e7	582,470	2.8 e8
Number of Airports	68	16.72	37.64	1	190
Long Term Debt (Thousands current dollars)	44	2,265,195	2,701,931	1.67	9,460,979
European Union	75	0.48	-	0	1

Source: Own elaboration. Note: Obs=Observations

Table 2. OLS Estimations results

Explanatory variables	Model 1	Model 2	Model 3
Regional airline	-6.96 (1.96)***	-7.38 (2.12)***	-6.78 (3.90)*
Alliance	-2.00 (1.83)	-2.15 (2.09)	-3.06 (3.53)
Seat Kilometers Available	2.3e-8 (1e-8)**	2.9e-8 (1.1e-8)**	6.5e-8 (3.1e-8)**
Number of Airports		-0.04 (0.02)*	-0.03 (0.03)
Long Term Debt			-1.4e-6 (8.3e-7)*
European Union	-2.24 (1.43)	-0.84 (1.57)	-2.78 (2.18)
Year	-3.42 (1.42)**	-2.96 (1.47)**	-3.82 (1.92)*
Constant	77.85 (1.88)***	77.14 (2.15)***	78.73 (3.11)***
Observations	75	68	41
F test	9.54***	9.12***	6.23***
R^2	0.19	0.24	0.36

Note 1: Significance test *** 1%, ** 5%, *10%.
Note 2: Standard Errors among brackets.