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Airline Quality Rating 1991

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Airline Quality Rating

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FOREWORD

The concept of developing the Airline Quality Rating (AQR) originated with Dr. Brent Bowen, Director of Aviation Management, W. Frank Barton School of Business and Director of the Center for Aviation Management Research at the National Institute for Aviation Research, Wichita State University, Wichita, Kansas.

The Airline Quality Rating methodology was developed by Bowen in association with Dr. Dean Headley, Assistant Professor of Marketing, W. Frank Barton School of Business, and Ms. Jacqueline Luedtke, Business Manager of the National Institute for Aviation Research. Developmental procedures involved identifying a substantial list of potential quality factors through extensive literature search, discussions with experts from airline associations, government agencies, each of the ten U.S.-based major airlines, and a variety of other related sources.

These efforts were aimed at discovering relevant, quantifiable, reliable factors for the development of an Airline Quality Rating scale. Factors considered for inclusion must be quantifiable and regularly available for each of the ten major domestic airlines currently operating in the U.S. Final factors for the AQR were reviewed by a group of 65 experts and validated as to their importance for inclusion in an Airline Quality Rating scale.

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The resources contributed by the National Institute for Aviation Research, W. Frank Barton School of Business, Center for Aviation Management Research, and the Ablah Library were crucial to the successful development of the Airline Quality Rating.

ABSTRACT

In today's competitive airline industry, it's crucial that an airline do all it can to attract and retain customers. One of the best ways to do this is by offering a quality service to consumers. Perceptions of service quality vary from person to person, but an enduring element of service quality is the consistent achievement of customer satisfaction. The satisfying of customer service needs keeps them loyal and helps establish a base for new customers.

An Airline Quality Rating scale is proposed that assesses the quality of the U.S. major airlines using comparable, objective, quantifiable, periodically published data that addresses customer satisfaction concerns. This data is not consumer opinion based, but has distinct performance characteristics that are specifically attuned to the consumers point of view. The AQR outlined here focuses on quantitative factors in order to provide a more reliable and objective result in assessing service quality levels across all major domestic airlines. The combining of quantifiable and readily available data provides an objective starting point for monitoring the quality of service an individual airline might be providing.

This unique method of measuring quality, without the burdensome task of surveying thousands of consumers, resulted in findings synonymous to a major consumer survey of 4,400 frequent flyers (Zagat 1990).

INTRODUCTION

The airline industry, as any service industry in today's competitive market, must be concerned with the quality of its service if it wants to survive. Achieving quality service is necessary in order to attract customers and, even more importantly, to retain current customers. For customers to perceive an airline as a valued quality service, they must be satisfied, and that usually means receiving a service outcome that is equal to or greater than what was expected.

There are many possible aspects that could influence the consumers perception of quality/satisfaction at different times in the consumption process. Fortunately, the consumer of airline services has information available regarding service performance that other industries do not currently provide. Unfortunately, the average consumer is most likely unaware of or uninterested in this detail of performance, and it goes unused in consumer decision making. Our objective in developing the AQR is to better organize the readily available data for the consumer and offer it in a more useful and understandable form.

WHAT IS QUALITY IN THE AIRLINE INDUSTRY?

Service quality in the airline industry means different things to different people. Table 1 outlines some factors that a Los Angles Times poll on airline quality found as major areas that airline customers perceived as being important in judging airline quality.

TABLE 1

CUSTOMERS' RATINGS OF AIRLINES

Overall Rating	Food
Comfort	Service
Timeliness	"Bang for the Buck"

Source: LA Times

In it's simplest form, airline service quality can be defined as passenger satisfaction. Put another way, quality is "continually satisfying customer requirements" (Smith, 1987). In the airline industry, passenger satisfaction is reflected in airline and government statistical reports by on-time performance, mishandled baggage, oversales, and consumer complaints. Performance data for these factors are easily obtained from the U.S. Department of Transportation. Other factors that address quality and passenger satisfaction that are available from other sources include such considerations as accidents/safety, financial stability of the airline, frequent flyer award programs, ability of the airline to perform as promised, comfort of the aircraft, price, quality of food, and hassle-free service. All of these contribute to a consumer's perspectives regarding quality. All of these factors make up service quality/satisfaction. There are certainly other, more qualitative factors such as comfort, pleasurableness, taste of food, and employee attitude. These subjective aspects are only assessable by direct inquiry of the consumer. This does

not make them less important, just less accessible. Elaborate surveying efforts are necessary to monitor this type of consumer opinion. Most of the major airlines already do this type of quality assessment and use the results to improve the service they offer the consumer. This information is, however, proprietary and not available to the public for their use in making better choices involving airline quality. As stated before, our intent is to identify a group of factors that can be monitored on a regular basis that addresses pertinent consumer concerns, but not necessarily all consumer quality concerns. The results from this data gathering/monitoring technique can consequently be compared to consumer data such as the Zaget Rating of Airlines to ascertain potential correlation.

TABLE 2

INFORMATION FROM THE AIR TRAVEL CONSUMER REPORT

Flight Problems (delays, cancellations, mis-connections, or any other deviations from schedule whether planned or unplanned)
Baggage
Refunds
Customer Service
Ticketing/Boarding and Disabled
Oversales
Fares
Smoking
Advertising
Tours

Credit
Other(Frequent Flier)

Source: U.S. Department of Transportation

SERVICE QUALITY DIMENSIONS FOR THE AIRLINE INDUSTRY

To help organize the search for factors, the work of Parasuraman, Zeithaml, and Berry (1985, 1988) in conceptualizing and defining service quality was used. The five dimensions of the SERVQUAL model, a multiple-item scale for measuring consumer perceptions of service quality, are a useful way to categorize factors relevant to airline service quality. Listed below are the major dimensions that these authors propose as useful in defining the service quality of any service and our suggestions as to how these relate to airline services.

TABLE 3

QUALITY DIMENSIONS FOR THE AIRLINE INDUSTRY

TANGIBLES Physical facilities, equipment, and appearance of personnel
Appearance/Cleanliness of Aircraft/ Airport Facilities
Age of Aircraft
Number of Aircraft (size of fleet)
Types of aircraft used

Number of Employees
Appearance of Employees
Revenue Management System (RMS) - "Yield" Management"
Reservation Network
Safety Record
On-aircraft storage for carry-on baggage

RELIABILITY Ability to perform the promised service consistently, dependably and accurately
On-time
Oversales
Mishandled Baggage
Load Factor
Frequent Flier Awards
Low Cost Air Fares
"Fair" Premiums at One-Carrier Dominated Hubs
Efficiency
Financial Viability of Airline - Net Earnings, Return on Investment, Return on Equity, Current Assets/Current Liabilities Ratio, RPMs (revenue per mile or the number of passengers carried one mile), ASMs (available seat miles)
Convenience - routes, flight times, number of possible connections, easy access terminals, gate assignments
Congestion of air traffic
Layoffs of employees

Maintenance capability/record
Innovativeness
Differentiation
Articulation agreements with commuter airlines

RESPONSIVENESS Willingness to help customers and provide prompt service
Consumer Complaints (12 complaint categories)
Competitive fares
Service to other connections

ASSURANCE Knowledge and courtesy of employees and their ability to inspire trust and confidence
Ability/leadership of Management
Awards for excellence/performance
Promptness of complaint handling
Competent employees

EMPATHY Caring, individualized attention the firm provides its customers (e.g. "knowing the customer," communication)
Percentage of Passengers Flying First Class

Catering to Women
In-Flight Services
Handling of children/elderly
Smoking policy

As shown, many of the factors outlined are qualitative and impossible to monitor from regularly published data sources. Many airlines have quality assurance/marketing research divisions dedicated to researching and tracking customer satisfaction factors; however, their findings are proprietary and not available for general public knowledge. In an effort to address this dilemma, the AQR scale was developed which focuses on more objective, quantitative, regularly published factors. Listed below are the group of factors that make up the AQR scale. Details as to how these factors are actually measured are included in the factors in the Airline Quality Rating starting on page 18.

HOW THE AIRLINE QUALITY RATING (AQR) WAS DEVELOPED

The AQR is proposed as a method of comparing major domestic airlines using a standard set of quality factors. In addition, the AQR helps identify which airline has the most favorable quality rating at any particular time. A major airline, as defined by the Department of Transportation, is an airline whose operating revenues for a 12-month period are one billion dollars or more. At the present time, there are ten U.S.-based airlines that meet this qualification (see Table 4).

TABLE 4

THE TEN MAJOR AIRLINES

AMERICAN
AMERICA WEST
CONTINENTAL
DELTA
NORTHWEST
PAN AM
SOUTHWEST
TRANS WORLD
UNITED
USAIR

The AQR scale is essentially a weighted average of 19 factors that have relevance to consumers when judging the quality of airline services (see Table 5). The factors represent a select group of concerns that were identified through a combination of research and opinion polling. Originally, over 80 factors were identified as potentially relevant for the AQR. This initial list was pared down using two criteria: 1) the factor had to be readily obtainable from published data for each airline; and 2) the factor had to have relevance to consumer concerns regarding quality. Methods used to achieve a reduction in the number of factors included record searches to determine the availability of the data, discussions with experts in the airline industry regarding relevance to consumers, and personal judgement of the research team. In arriving at the final 19 items, a specific inquiry was made to a group of 65 experts in the field. These experts included representatives of most

major airlines, air travel experts, FAA representatives, academic researchers, airline manufacturing and support firms, and individual consumers. The result of this inquiry allowed a final list of critical factors to be identified. This survey of opinion process was also used to establish the weights for each of the factors.

TABLE 5

FACTORS INCLUDED IN THE AIRLINE QUALITY RATING (AQR)

#	FACTOR
1	Average Age of Fleet
2	Number of Aircraft
3	On-Time Performance
4	Load Factor
5	Pilot Deviations
6	Number of Accidents
7	Frequent Flier Awards
8	Flight Problems (Consumer Complaints)
9	Oversales (Consumer Complaints)
10	Mishandled Baggage (Consumer Complaints)

#	FACTOR
11	Fares (Consumer Complaints)
12	Customer Service (Consumer Complaints)
13	Refunds (Consumer Complaints)
14	Ticketing/Boarding (Consumer Complaints)
15	Advertising (Consumer Complaints)
16	Credit (Consumer Complaints)
17	Other (Consumer Complaints)
18	Financial Stability
19	Average Seat-Mile Cost (Average Yield)

During the gathering of opinion from this diverse group, each expert was asked to rate the importance that each individual factor might have to a consumer of airline services using a scale of 0 (no importance) to 10 (great importance). As a result of these discussions and ratings, some factors were excluded from further consideration. The average importance ratings for each factor were also used as the weights for that factor in the AQR. Due to the continuous nature of the rating scale, the reliability (freedom from random error and it's ability to yield consistent results) of the scale can be established. The 19-item rating scale has a reliability coefficient (Cronbach's Alpha) of 0.87 (with 1.00 being perfect) for the sample of 65 experts surveyed. This suggests that the 19-factor AQR is very reliable and the ratings given by this sample of experts would be similar for other comparable sample groups as well.

The basic formula for calculating the Airline Quality Rating is:

$$AQR = \frac{w_1F1 + w_2F2 - w_3F3 + \ldots w_{19}F19}{w_1 + w_2 + w_3 + \ldots w_{19}}$$

Each factor (F) has a weight (w), ranging from 0 = no importance to 10 = great importance, that reflects the importance of that factor in the overall AQR. Also, each weight and factor has an associated plus or minus sign in the formula (see Table 6). The sign associated with the weight and factor reflects the nature of the impact that a factor should have on an Airline's Quality Rating. For instance, the factor that includes on-time performance is included as a positive because it is

reported in terms of on-time success, suggesting that a higher number is favorable to consumers. The weight for this factor is high (8.63) due to the importance most consumers place on this aspect of airline service. Conversely, the factor that includes accidents is included as a negative because it is reported in terms of accidents per hours flown suggesting that a higher number is unfavorable to consumers. The weight for this factor is also high (8.38) since safety is important to most consumers. It is important to remember that weights and positive/negative signs are independent of each other. Weights reflect importance of the factor in consumer decision making, while sign reflects the direction of impact that the factor should have on the consumers rating of airline quality.

Taken as a whole, we believe the AQR is reflective of the critical quality aspects that a consumer of airline services might consider and that the signs and weights attached to each factor reflect consumer attitudes as well. Table 6 displays the 19 factors, the weights associated with each, and the positive/negative sign for each factor. A full listing of the factors, the definitions for each, and the sources of the data are included in the model definition.

TABLE 6

FACTOR WEIGHT AND SIGN

#	FACTOR	WEIGHT	SIGN (+/-)
1	Average Age of Fleet	5.85	-
2	Number of Aircraft	4.54	+
3	On-Time	8.63	+
4	Load Factor	6.98	-
5	Pilot Deviations	8.03	-
6	Number of Accidents	8.38	-
7	Frequent Flier Awards	7.35	-
8	Flight Problems (Consumer Complaints)	8.05	-
9	Oversales (Consumer Complaints)	8.03	-
10	Mishandled Baggage (Consumer Complaints)	7.92	-
11	Fares (Consumer Complaints)	7.60	-
12	Customer Service (Consumer Complaints)	7.20	-
13	Refunds (Consumer Complaints)	7.32	-
14	Ticketing/Boarding (Consumer Complaints)	7.08	-
15	Advertising (Consumer Complaints)	6.82	-
16	Credit (Consumer Complaints)	5.94	-
17	Other (Consumer Complaints)	7.34	-
18	Financial Stability	6.52	+
19	Average Seat-Mile Cost (Average Yield)	4.49	-

FINDINGS

When all of the factor values and their associated weights are combined for an airline as outlined in the AQR formula, a single value for each airline is obtained. Due to the construction of the AQR, this value is comparable among the airlines for the designated reporting period. Table 7 shows the AQR values for the ten major airlines for the January, 1991 reporting period. This table also displays the rank order of the airlines using the AQR values. For comparison purposes, the rank ordering of the airlines given by a recent consumer survey is displayed in Table 8. It can be seen that ranking results for airlines are very similar using either the AQR or the consumer survey. As a researcher, this basic convergent validity for the AQR is noteworthy. As an airline industry watcher, obtaining similar rankings to a large consumer survey using the AQR is exciting, since the AQR is regularly available and less cumbersome to achieve. Given that the ranking results are very close, using the AQR to monitor airline quality ratings offers a simpler, more responsive approach to monitoring the quality of airline performance on a regular and timely basis. Table 9 shows a graph of the AQR results.

TABLE 7

AIRLINE QUALITY RATING RESULTS
JANUARY 1991

AIRLINE	AQR RESULTS	RANK ORDER USING AQR
American	+.295	1
Delta	+.150	2
Southwest	+.140	3
United	+.116	4
USAir	+.067	5
Pan Am	+.010	6
Northwest	-.106	7
Continental	-.301	8
TWA	-.444	9
America West	-.445	10

TABLE 8

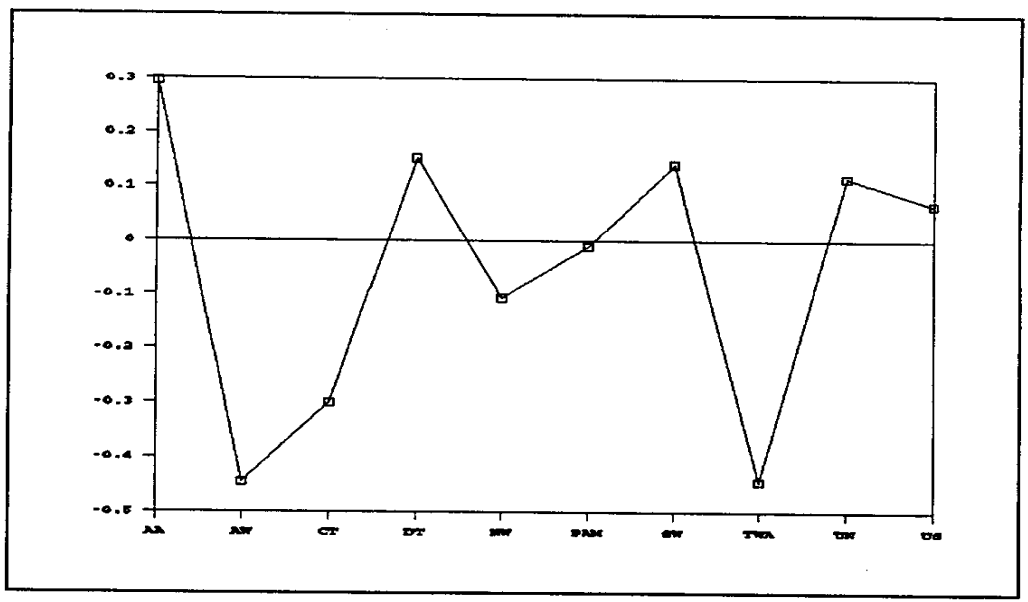
AIRLINE QUALITY RATING COMPARED TO ZAGAT CONSUMER SURVEY

AIRLINE	RANK ORDER USING AQR	RANK ORDER USING ZAGAT CONSUMER SURVEY*
American	1	1
Delta	2	2
Southwest	3	Not Ranked
United	4	3
USAir	5	7

Pan Am	6	5
Northwest	7	6
Continental	8	8
TWA	9	4
America West	10	Not Ranked

*Source: Zagat Rates. (1991, January). Frequent Flyer, pp. 32-35.

TABLE 9
GRAPH OF AQR RESULTS



CONCLUSION

In today's competitive environment in the airline industry, it's imperative that a company does all it can to attract customers and keep customers. Companies are learning that it is important to monitor customers needs and wants and then strive to meet those needs and wants. If an airline fails to provide quality/satisfaction in it's services (i.e. passenger satisfaction), it will lose customers to its competitors. If this continues long enough, the airline will, of course, go bankrupt or be taken over.

In order to assess quality in the airline industry, we have two types of measurement factors: qualitative and quantitative. The qualitative factors are difficult to measure and are, more or less, how customers "perceive" the airline's quality. These can be somewhat determined by surveys, focus groups, interviews, etc. and are difficult to monitor on a comparative basis. The Airline Quality Rating scale developed here offers a way to compare the quality of airlines by using strictly quantitative, comparable, regularly published factors. This does not take all aspects of quality into account and does not tell the whole story. It does provide a way to judge the impact on service quality for all airlines for some of the factors that passengers notice most. This approach presents an acceptable, more objective, approach for an airline to assess its quality of service compared with other competitors on factors that are important to customers. The comparability using the AQR to results of a major consumer survey of 4,400 frequent fliers is notable.

Our basic intent is the development of an Airline Quality Rating (AQR) that

can be used as a point of comparison by consumers and industry watchers alike in evaluating the comparative quality of the major domestic airlines in the United States. To achieve this, an array of consumer concerns are combined to arrive at a multi-factor rating scale that can be easily monitored on a periodic basis. Data that supports the factors contained in the scale are all available through regularly published public or proprietary sources. It is our intent that regular monitoring of this group of factors can bring a more common comparative base to the consumer decision process and help in making informed decisions.

FACTORS INCLUDED

IN THE

AIRLINE QUALITY RATING

FACTOR 1
AVERAGE AGE OF FLEET
This quantifiable, regularly published data can be obtained from FAA Data Base Phase II Research Project, Airline Economics, and each airline's annual report or 10-K. This data is reported in years of service and then averaged. AQR uses the average age for the airline as a percentage of industry average for that period.

SOURCES: Hutchinson, John, & Smith, Barbara K. (1990). FAA data base - phase II research project (NIAR Report 90-31). Wichita, KS: Wichita State University, National Institute for Aviation Research.

James, George. (1990). Average age of major U.S.-based air carriers. Airline Economics.

Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR 2
NUMBER OF AIRCRAFT (SIZE OF FLEET)
This quantifiable, regularly published data can be obtained from FAA Data Base Phase II Research Project and each airline's annual report/Form 10-K. This data is reported in the number of each type of aircraft the airline utilizes and the total number. AQR uses the number of aircraft for each airline as a percentage of the total fleet of all airlines included.

SOURCES: Hutchinson, John, & Smith, Barbara K. (1990). FAA data base - phase II research project (NIAR Report 90-31). Wichita, KS: Wichita State University, National Institute for Aviation Research.

Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR 3
ON-TIME PERFORMANCE
Quantifiable, regularly published data regarding on-time performance can be obtained from the Airline Economics, Inc. as reported in Aviation Daily and the U.S. Department of Transportation's *Air Travel Consumer Report*. According to DOT, a flight is counted "on time" if it is within 15 minutes of scheduled arrival or departure time shown in the carriers' Computerized Reservations Systems. Delays caused by mechanical problems are not counted. Canceled and diverted operations are counted as late. Data is available by percentage, by number of carriers and airports, and number of aircraft arriving late 80% (or more) of the time. AQR uses the percentage of flights on time for each airline as a decimal.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports.

Office of Consumer Affairs. (1991, March). Air Travel Consumer Report. Washington, DC: U.S. Department of Transportation.

Overall percentages of reported domestic flights arriving on time, by carrier, August 1990. (1990, October). Aviation Daily, p. 57.

FACTOR 4
LOAD FACTOR
Quantifiable, regularly published data regarding load factor can be obtained from each airline's annual report/10-K and Airline Executive International. This is an aspect of the efficiency of an airline in its bookings, routes, time schedules, and competitive analysis. Data is reported as the percentage of seats filled per airline per month.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

Airline Statistics. (1991, March). Airline Executive International, pp. 48-49.

FACTOR 5
PILOT DEVIATIONS
Quantifiable, regularly published data in the form of pilot deviations can be obtained from the National Transportation Safety Board and the FAA Pilot Deviation Subsystem. According to the NTSB, a pilot deviation is defined as the actions of a pilot that may result in the violation of a Federal Aviation Regulation or a North American Aerospace Air Defense Identification Zone tolerance. This data is reported by the number of pilot deviations each year per carrier. AQR uses the ratio of deviations reported per 10,000 hours flown for each airline.

SOURCES: Select statistics for top U.S. scheduled air carriers. (1990). Washington, D.C.: National Transportation Safety Board.

FACTOR 6
NUMBER OF ACCIDENTS
Quantifiable, regularly published data regarding the number of accidents can be obtained from the National Transportation Safety Board (NTSB). According to the NTSB, an accident is defined as an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and until such time as all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage.This data is reported each year by the total number of accidents per hours flown per carrier. AQR uses the ratio of accidents reported per 10,000 hours flown.

SOURCES: Select statistics for top U.S. scheduled air carriers. (1990). Washington, D.C.: National Transportation Safety Board.

FACTOR 7
FREQUENT FLIER AWARDS
Quantifiable, regularly published data regarding frequent flier clubs and minimum mileage needed for two free round-trip tickets can be obtained from each airline, from the Office of the Secretary of Transportation, and, periodically, from other newspaper or magazine articles.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

Frequent flier clubs. (1990, October 22). USA Today, p.13E.

Office of Consumer Affairs. (1991, March). Air Travel Consumer Report. Washington, DC: U.S. Department of Transportation.

Office of the Secretary of Transportation. (1990). Secretary's task force on competition in the U.S. domestic airline industry: Pricing executive summary. Washington, DC: U.S. Department of Transportation.

Office of the Secretary of Transportation. (1990). Secretary's task force on competition in the U.S. domestic airline industry: Airline marketing practices: travel agencies, frequent-flyer programs, and computer reservation systems. Washington, DC: U.S. Department of Transportation.

Ott, James. (1988, April). Impact of frequent fliers compels program revision. Aviation Week & Space Technology, pp. 130-131.

FACTOR 8
FLIGHT PROBLEMS (CONSUMER COMPLAINTS) **DELAYS, CANCELLATIONS, AND MISCONNECTIONS**
Quantifiable, regularly published data regarding consumer complaints about delays can be obtained from the U.S. Department of Transportation's *Air Travel Consumer Report*. According to DOT, a flight is listed as a flight problem if it is delayed from schedule, whether planned or unplanned. Data is available by the total number of consumer complaints pertaining to delays, cancellations, and misconnections and by the number of complaints regarding delays, cancellations, and misconnections against each airline per month. AQR uses the total delays reported for each airline as a percentage of total delays for all airlines included.

SOURCES: Office of Consumer Affairs. (1991, March). Air Travel Consumer Report. Washington, DC: U.S. Department of Transportation.

FACTOR 9
DENIED BOARDINGS
This factor includes denied involuntary boardings. Quantifiable, regularly published data regarding denied boardings can be obtained from *Air Transport World* and the U.S. Department of Transportation's *Air Travel Consumer Report*. Data includes the number of passengers who are involuntarily denied boarding. AQR uses the ratio of involuntary denied boardings per 10,000 passengers.

SOURCES: Office of Consumer Affairs. (1991, March). Air Travel Consumer Report. Washington, DC: U.S. Department of Transportation.

U.S. major and national airlines denied passenger boardings. (1990, August). Air Transport World, p. 105.

FACTOR 10
MISHANDLED BAGGAGE REPORTS
Quantifiable, regularly published data regarding consumer complaints about mishandled baggage can be obtained from the U.S. Department of Transportation's *Air Travel Consumer Report*. According to DOT, consumer complaints about mishandled baggage include claims for lost, damaged or delayed baggage, charges for excess baggage, carry-on problems, and difficulties with airline claim procedure. Data is reported by the rate of mishandled baggage reports per 1000 passengers by carrier and for the industry. The AQR ratio is based on the total number of reports each carrier received from passengers concerning lost, damaged, delayed or pilfered baggage per 10,000 passengers.

SOURCES: Office of Consumer Affairs. (1991, March). Air Travel Consumer Report. Washington, DC: U.S. Department of Transportation.

FACTOR 11
FARES (CONSUMER COMPLAINTS)
Quantifiable, regularly published data regarding consumer complaints about fares can be obtained from the U.S. Department of Transportation's *Air Travel Consumer Report*. According to DOT, consumer complaints about fares include incorrect or incomplete information about fares, discount fare conditions and availability, overcharges, fare increases and level of fares in general. Data is reported by the number of consumer complaints pertaining to fares and by the number of complaints regarding fares against each airline per month. AQR uses the percentage of complaints reported per airline based on the total complaints regarding fares for the period.

SOURCES: Office of Consumer Affairs. (1991, March). Air Travel Consumer Report. Washington, DC: U.S. Department of Transportation.

FACTOR 12
CUSTOMER SERVICE (CONSUMER COMPLAINTS)
Quantifiable, regularly published data regarding the number of consumer complaints about customer service can be obtained from the U.S. Department of Transportation's *Air Travel Consumer Report*. This factor includes rude or unhelpful employees, inadequate meals or cabin service, treatment of delayed passengers. This data is reported by the total number of complaints received per month regarding customer service by the DOT for all airlines and the number against each airline per month. AQR uses a percentage of customer service complaints reported per airline based on the total complaints regarding customer service for the period.

SOURCES: Office of Consumer Affairs. (1991, March). Air Travel Consumer Report. Washington, DC: U.S. Department of Transportation.

FACTOR 13
REFUNDS (CONSUMER COMPLAINTS)
Quantifiable, regularly published data regarding refunds can be obtained from the U.S. Department of Transportation's *Air Travel Consumer Report*. This factor includes problems in obtaining refunds for unused or lost tickets or fare adjustments. This data is reported by the total number of complaints received per month regarding consumer complaints concerning refunds by the DOT for all airlines and the number against each airline per month. This is an important factor of service quality. AQR uses a percentage of refund complaints for each airline as based on the total refund complaints for the airlines included.

SOURCES: Office of Consumer Affairs. (1991, March). Air Travel Consumer Report. Washington, DC: U.S. Department of Transportation.

FACTOR 14
TICKETING/BOARDING (CONSUMER COMPLAINTS)
Quantifiable, regularly published data regarding ticketing and boarding consumer complaints can be obtained from the *Air Travel Consumer Report*. This includes airline or travel agent mistakes in reservations and ticketing; problems in making reservations and obtaining tickets due to busy telephone lines or waiting in line, or delays in mailing tickets; problems boarding the aircraft (except oversales); and complaints involving disabled air travelers. This data is reported by the total number of complaints received per month regarding complaints concerning ticketing/boarding by the DOT for all airlines and the number against each airline per month. AQR uses the percentage of ticketing/boarding complaints for each airline based on the total ticketing/boarding complaints for the airlines included.

SOURCES: Office of Consumer Affairs. (1991, March). Air Travel Consumer Report. Washington, DC: U.S. Department of Transportation.

FACTOR 15
ADVERTISING (CONSUMER COMPLAINTS)
Quantifiable, regularly published data regarding consumer complaints concerning advertising can be obtained from the *Air Travel Consumer Report*. These are complaints concerning advertising that is unfair, misleading or offensive to consumers. This data is reported by the total number of complaints received per month regarding complaints concerning advertising by the DOT for all airlines and the number against each airline per month. AQR uses the percentage of advertising complaints for each airline as based on the total advertising complaints for the airlines included.

SOURCES: Office of Consumer Affairs. (1991, March). Air Travel Consumer Report. Washington, DC: U.S. Department of Transportation.

FACTOR 16
CREDIT (CONSUMER COMPLAINTS)
Quantifiable, regularly published data regarding consumer complaints concerning credit can be obtained from the *Air Travel Consumer Report*. These are problems concerning denial of credit, interest or late payment charges, incorrect billing, or incorrect credit reports on airline-issued credit. This data is reported by the total number of complaints received per month regarding complaints concerning credit by the DOT for all airlines and the number against each airline per month. AQR uses the percentage of credit complaints for each airline as based on the total credit complaints for the airlines included.

SOURCES: Office of Consumer Affairs. (1991, March). Air Travel Consumer Report. Washington, DC: U.S. Department of Transportation.

FACTOR 17
OTHER (CONSUMER COMPLAINTS)
Quantifiable, regularly published data regarding cargo problems, security, airport facilities, claims for bodily injury, frequent flyer programs, and other problems not classified above can be obtained from the U.S. Department of Transportation's *Air Travel Consumer Report*. This data is reported by the total number of complaints received per month regarding tours, smoking, and other consumer complaints by the DOT for all airlines and the number against each airline per month. AQR uses the percentage of other complaints for each airline as a percentage of total other complaints for all airlines included.

SOURCES: Office of Consumer Affairs. (1991, March). Air Travel Consumer Report. Washington, DC: U.S. Department of Transportation.

FACTOR 18
FINANCIAL STABILITY
Quantifiable, regularly published data regarding the financial stability of an airline can be obtained from each airline's corporate bond rating by Moody's Investment Services. Including this indicator of financial stability responds to the consumer's need to trust that an airline will be available to render the service which was purchased. AQR assigns a numerical value to each of the potential 19 rating levels with Aaa = 19 to C = 1.

SOURCES: Moody's Bond Record. (1991, February). Vol. 57.

FACTOR 19
AVERAGE SEAT-MILE COST
Quantifiable, regularly published data regarding average seat-mile cost for an airline can be obtained from each airline's annual report/10-K. These are the operating expenses per available passenger seat mile. This data is reported by the amount it costs (in cents) the carrier for each seat per each mile.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K or the most recent available data.

APPENDIX A

OTHER POTENTIAL FACTORS NOT INCLUDED IN THE AIRLINE QUALITY RATING

Average Aircraft Flight Length (Miles)
Mix of the Fleet (Types of Aircraft)
Number of Aircraft on Order
Number of Employees
Revenue Management System (RMS) - "Yield Management" Reservation Network - Computer Artificial Intelligence)
Breakeven Load Factor
Number of Landings/Departures
Number of Scheduled Flight Hours (Aircraft Utilization)
Receivables Turnover
Inventory Turnover
Fixed-Asset Turnover
Total Asset Turnover
Current Ratio
Quick Ratio
Net Working Capital to Total Assets
Times Interest Earned
Fixed-Charge Coverage
Price to Book Value Ratio
Dividends to Price (Yield) Ratio
Average Tax Rate Ratio
Dividend Payout Ratio
Sales per Share Ratio
Profitability Ratios: After-Tax Profit Margin
Profitability Ratios: Return on Assets
Profitability Ratios: Return on Equity
Debt-Utilization Ratios: Long-Term Debt to Equity
Debt-Utilization Ratios: Total Debt to Total Assets

Earnings Per Share (EPS)
Price Ratios: Price to Earnings (P/E) Ratio
Net Earnings
Employee Cost
Cost of Frequent Flier Programs
Flight Times
Number of Routes Served Nonstop
Number of Possible Daily Connections
Routes
Revenue Passenger Miles (RPMs)
Available Seat Miles (ASMs)
Average Aircraft Utilization (Flight Hours)
Number of Consumer Complaints (per 100,000 passengers)
% Aircraft Owned vs. % Leased
Comment Cards
Appearance/Cleanliness of Aircraft/Airport Facilities
Low Cost Air Fares
"Fair" Premiums at One-Carrier Dominated Hubs
Concentration of Traffic/Congestion
Layoffs
In-House Maintenance Capability
Innovativeness
Differentiation
Articulation Agreements with Commuter Airlines
Quality of Management
Awards
Pleasant, Competent Employees
Airline's Ability to Attract and Keep Talented Employees

Catering to Women
In-Flight Services
Percentage of Passengers Flying First Class
Handling of Complaints

FACTOR
AVERAGE AIRCRAFT FLIGHT LENGTH (MILES)
Quantifiable, regularly published data regarding the average flight length can be obtained from the airline's annual report/10-K. This data is reported in average number of miles flown per day per carrier. This is an important factor with regards to making consumers feel the airline is a safe and dependable mode of transportation because on longer flights, pilots may become weary and more prone to carelessness.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
MIX OF THE FLEET (TYPES OF AIRCRAFT)
This quantifiable, regularly published data can be obtained from FAA Data Base Phase II Research Project and each airline's annual report/10-K. The mix of the fleet is the type and amount of each aircraft the airline utilizes, e.g. the number of Boeing, McDonald Douglas, AirBus, etc. airplanes and the number of 727s, 737s, 747s, DC-10s, A300s, A320s, etc. This is an important factor with regards to efficiency and profitability - utilizing the correct size and type of aircraft for each route - and safety, convenience, scheduling, and redundancy (backup aircraft).

SOURCES: Hutchinson, John, & Smith, Barbara K. (1990). FAA data base - phase II research project (NIAR Report 90-31). Wichita, KS: Wichita State University, National Institute for Aviation Research.

Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
NUMBER OF AIRCRAFT ON ORDER
This quantifiable, regularly published data can be obtained from each airline's annual report/10-K. This is an important factor with regards to maintaining an up-to-date airline fleet, safety, convenience, scheduling, redundancy (backup aircraft), and efficiency.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
NUMBER OF EMPLOYEES
This quantifiable, regularly published data can be obtained from each airline's annual report/10-K. This is an important factor with regards to the ratio of employees to consumers which can be an indication of the amount of service available to each passenger.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
REVENUE MANAGEMENT SYSTEM (RMS) - "YIELD MANAGEMENT" **(Reservation Network - Computer Artificial Intelligence)**
This data can be obtained from many sources, including each airline's annual report. By utilizing a Revenue Management System, airlines can optimize the mix of full fare and discount traffic to produce the most revenue and fewest empty seats. It's important for airlines to secure first choice of bookings from travel agents, thus increasing revenue and, thus, theoretically increasing service quality.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports.

Office of the Secretary of Transportation. (1990). Secretary's task force on competition in the U.S. domestic airline industry: Airline marketing practices: travel agencies, frequent-flyer programs, and computer reservation systems. Washington, DC: U.S. Department of Transportation.

FACTOR
BREAKEVEN LOAD FACTOR
Quantifiable, regularly published data regarding breakeven load factor can be obtained from each airline's annual report/10-K. This is the percentage of passengers needed to fill the carrier's planes in order for the airline to "break even".

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
NUMBER OF LANDINGS/DEPARTURES
Quantifiable, regularly published data regarding the number of landings/departures can be obtained from each airline's time table. By analyzing the airline's number of landings/departures, it can be determined how convenient an airline is in meeting passengers' needs.

SOURCES: Ten U.S.-based major airlines. (1990). Time Tables.

FACTOR
NUMBER OF SCHEDULED FLIGHT HOURS
Quantifiable, regularly published data regarding the number of scheduled flight hours can be obtained from the National Transportation Safety Board and sometimes from each airline's annual report. This data is reported by the number of hours scheduled per year and the number of hours per day the aircraft is utilized. By analyzing the airline's number of scheduled flight hours, it can be determined how much the carrier's fleet is being under-utilized or over-utilized.

SOURCES: Select statistics for top U.S. scheduled air carriers. (1990). Washington, D.C.: National Transportation Safety Board.

Ten U.S.-based major airlines. (1990). Annual reports.

FACTOR
RECEIVABLES TURNOVER
Quantifiable, regularly published data regarding receivables turnover of an airline can be obtained from each airline's annual report/10-K. Receivables turnover = Sales/Receivables. By analyzing the airline's receivables turnover, it can be determined how the income statement (numerator) relates to the various assets on the balance sheet. This ratio measures how many times per year an airline collects its accounts receivables.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
INVENTORY TURNOVER
Quantifiable, regularly published data regarding inventory turnover of an airline can be obtained from each airline's annual report/10-K. Inventory turnover = Sales/Inventory. This ratio relates the income statement (numerator) to the various assets on the balance sheet; it measures how many times per year the carrier sells its inventory.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
FIXED-ASSET TURNOVER
Quantifiable, regularly published data regarding fixed-asset turnover of an airline can be obtained from each airline's annual report/10-K. Fixed Asset turnover = Sales/Fixed Assets. By analyzing the airline's fixed-asset turnover, it can be determined how the income statement relates to the various assets on the balance sheet; it tells us how productive the fixed assets are in terms of sales generation.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
TOTAL ASSET TURNOVER
Quantifiable, regularly published data regarding total asset turnover of an airline can be obtained from each airline's annual report/10-K. Total Asset turnover = Sales/Total Assets. This ratio relates the income statement to the various assets on the balance sheet; it tells us how productive the total assets are in terms of sales generation.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports.

FACTOR
CURRENT RATIO
Quantifiable, regularly published data regarding current ratio of an airline can be obtained from each airline's annual report/10-K. Current Ratio = Current Assets/Current Liabilities. By analyzing the airline's current ratio, it can be determined whether the carrier can pay off its short-term debt in an emergency by liquidating its current assets.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
QUICK RATIO
Quantifiable, regularly published data regarding quick ratio of an airline can be obtained from each airline's annual report/10-K. Quick Ratio = (Current Assets - Inventory)/ Current Liabilities. The quick ratio looks only at the most liquid assets which include cash, marketable securities, and receivables.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
NET WORKING CAPITAL TO TOTAL ASSETS
Quantifiable, regularly published data regarding net working capital to total assets of an airline can be obtained from each airline's annual report/10-K. Net Working Capital to Total Assets = (Current Assets - Current Liabilities)/Total Assets. This ratio is a measure of the percentage of current assets (after short-term debt has been repaid) to total assets. This indicates the liquidity of the assets of the firm. The higher the ratio, the greater the short-term assets relative to fixed assets and the safer the creditor.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports.

FACTOR
TIMES INTEREST EARNED
Quantifiable, regularly published data regarding times interest earned of an airline can be obtained from each airline's annual report/Form 10-K. Times Interest Earned = (Income before Interest and Taxes)/Interest. This ratio indicates the airline's ability to meet its cash payments due on its fixed obligations such as interest. The higher this ratio, the more protected the creditor's position.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports.

FACTOR
FIXED-CHARGE COVERAGE
Quantifiable, regularly published data regarding fixed-charge coverage of an airline can be obtained from each airline's annual report/10-K. Fixed-Charge Coverage = Income before Fixed Charges and Taxes/Fixed Charges. This ratio indicates the airline's ability to meet its cash payments due on fixed obligations such as leases, licensing fees, or sinking-fund charges. The higher the ratio, the more protected the creditor's position.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
PRICE TO BOOK VALUE RATIO
Quantifiable, regularly published data regarding price to book value ratio of an airline can be obtained from each airline's annual report/Form 10-K. Price to Book Value = Common Stock Price/Book Value per Share. This ratio indicates the expectations of the market relative to other airlines. It relates the market value of the carrier to the historical accounting value of the airline.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
DIVIDENDS TO PRICE (YIELD) RATIO
Quantifiable, regularly published data regarding dividends to price (yield) ratio of an airline can be obtained from each airline's annual report/10-K. Dividends to Price (yield) Ratio = Dividends per Share/Common Stock Price. The dividend yield is part of the total return that an investor receives along with capital gains or losses. This ratio relates the internal performance of the airline to the external judgement of the marketplace in terms of value.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
AVERAGE TAX RATE RATIO
Quantifiable, regularly published data regarding average tax rate ratio of an airline can be obtained from each airline's annual report/10-K. Average Tax Rate = Income Tax/Taxable Income. This ratio helps analysts spot special tax situations that impact the profitability of an industry or company and to determine what percentage of earnings are being paid to the stockholder and what is being reinvested for internal growth.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
DIVIDEND PAYOUT RATIO
Quantifiable, regularly published data regarding dividend payout ratio of an airline can be obtained from each airline's annual report/10-K. Dividend Payout Ratio = Dividends per Share/ Earnings per Share. This ratio provides data concerning the airlines reinvestment strategies. A high payout ratio indicates that stockholders are receiving a large part of the earnings and the airline isn't retaining much income for investment in new equipment.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
SALES PER SHARE RATIO
Quantifiable, regularly published data regarding sales per share ratio of an airline can be obtained from each airline's annual report/10-K. Sales per Share = Sales (Operating Revenue)/Shares. This ratio indicates how the airline is doing from year to year.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
PROFITABILITY RATIOS: **AFTER-TAX PROFIT MARGIN**
Quantifiable, regularly published data regarding the after-tax profit margin of an airline can be obtained from each airline's annual report/10-K. After-Tax Profit Margin = Net Income/Sales. By analyzing the airline's after-tax profit margin, along with other profitability ratios, the ability of the airline to earn an adequate return on sales, total assets, and invested capital can be measured.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
PROFITABILITY RATIOS: **RETURN ON ASSETS**
Quantifiable, regularly published data regarding return on assets of an airline can be obtained from each airline's annual report/10-K. Return on Assets = Net Income/Total Assets. By analyzing the airline's return on assets, along with other profitability ratios, the ability of the airline to earn an adequate return on sales, total assets, and invested capital can be measured. This ratio is also called the Asset Turnover Ratio.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
PROFITABILITY RATIOS: **RETURN ON EQUITY**
Quantifiable, regularly published data regarding return on equity of an airline can be obtained from each airline's annual report/10-K. Return on Equity = Net Income/Stockholders Equity or Return on Assets/(1-Debt/Assets). By analyzing the airline's return on equity, along with other profitability ratios, the ability of the airline to earn an adequate return on sales, total assets, and invested capital can be measured.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
DEBT-UTILIZATION RATIOS: **LONG-TERM DEBT TO EQUITY**
Quantifiable, regularly published data regarding long-term debt to equity of an airline can be obtained from each airline's annual report/10-K. Long-Term Debt to Equity = Long-Term Debt/Stockholders' Equity. Analyzing the airline's long-term debt to equity provides an indication of the way the firm is financed between debt (lenders) and equity (owners) and therefore helps to determine the amount of financial risk present in the firm. This ratio indicates how much financial leverage is being used by the firm. The more debt, the greater the interest payments and the more volatile the impact on the firm's earnings. It provides information concerning the long-term capital structure of the firm.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
DEBT-UTILIZATION RATIOS: **TOTAL DEBT TO TOTAL ASSETS**
Quantifiable, regularly published data regarding total debt to total assets of an airline can be obtained from each airline's annual report/10-K. Total Debt to Total Assets = Total Debt/Total Assets. Analyzing the airline's total debt to total assets provides an indication of the way the firm is financed between debt (lenders) and equity (owners) and therefore helps to determine the amount of financial risk present in the firm. This ratio looks at the total assets and the use of borrowed capital.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
EARNINGS PER SHARE (EPS)
Quantifiable, regularly published data regarding earnings per share of an airline can be obtained from each airline's annual report/10-K. Earnings Per Share = Earnings available to common stockholders divided by the number of common stock shares outstanding. Earnings Per Share models are used for valuation. One of the most common ways of forecasting earnings per share is to use regression or least squares trend analysis. This technique involves a statistical method whereby a trendline is fitted to a time series of historical earnings. This trendline is a straight line which minimizes the distance of the individual observations from the line.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
PRICE RATIOS: **PRICE TO EARNINGS (P/E) RATIO**
Quantifiable, regularly published data regarding price to earnings (P/E) ratio of an airline can be obtained from each airline's annual report/10-K. Price to Earnings = Common Stock Price/Earnings Per Share. By analyzing the airline's price to earnings, along with other price ratios, the internal performance of the airline compared to the external judgment of the marketplace in terms of value and be determined. The P/E ratio is influenced by the earnings and the sales growth of the firm and by the risk (or volatility in performance), the debt-equity structure of the firm, the dividend-payment policy, the quality of management, etc. The P/E ratio indicates expectations about the future of a company.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
NET EARNINGS
Quantifiable, regularly published data regarding earnings per share for an airline can be obtained from each airline's annual report/10-K. When compared year to year, the airline's net earnings indicate how stable/unstable the airline is from year to year.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
EMPLOYEE COST
Quantifiable, regularly published data regarding employee cost for an airline can be obtained from each airline's annual report/10-K. The airline's employee cost can be compared with similar industry costs to determine how the airline rates with other airline costs.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
COST OF FREQUENT FLIER PROGRAMS
Quantifiable, regularly published data regarding the cost of frequent flier programs for an airline can be obtained from each airline's annual report. By analyzing the airline's frequent flier costs, it can be determined whether the frequent flier programs are financially harming or helping the airline.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports.

FACTOR
FLIGHT TIMES
Quantifiable, regularly published data regarding the airline's flight times can be obtained from each airline's time tables. By analyzing the airline's flight times, it can be determined how convenient the schedules are for passengers by the number of departures/arrivals per day at any city, etc.

SOURCES: Ten U.S.-based major airlines. (1990). Time tables.

FACTOR
NUMBER OF ROUTES SERVED NONSTOP
Quantifiable, regularly published data regarding the number of routes served nonstop can be obtained from each airline's time tables. By analyzing the airline's number of routes served nonstop, it can be determined how convenient the airline's schedules are for passengers or how many times passengers will have to change planes, etc.

SOURCES: Ten U.S.-based major airlines. (1990). Time tables.

FACTOR
NUMBER OF POSSIBLE DAILY CONNECTIONS
Quantifiable, regularly published data regarding the number of possible daily connections can be obtained from each airline's time tables. By analyzing the airline's number of possible daily connections, it can be determined how efficient and convenient it is to utilize a particular airline to reach a certain destination.

SOURCES: Ten U.S.-based major airlines. (1990). Time tables.

FACTOR
ROUTES
Quantifiable, regularly published data regarding the airline's routes can be obtained from each airline's time tables and annual report. By analyzing the airline's routes, the number of available destinations can be determined; this indicates the convenience of schedules for passengers.

SOURCES: Ten U.S.-based major airlines. (1990). Time tables.

Ten U.S.-based major airlines. (1990). Annual reports.

FACTOR
REVENUE PASSENGER MILES (RPMs)
Quantifiable, regularly published data regarding revenue passenger miles (RPMs) for an airline can be obtained from each airline's annual report/10-K and from *Airline Executive International*. RPMs are the number of passengers carried one mile. This data is reported by the millions. By analyzing the airline's revenue passenger miles and the percentage change in RPMs by year, it can be determined if the carrier is improving its revenue base year to year.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

Airline Statistics. (1991, March). Airline Executive International, pp. 48-49.

FACTOR
AVAILABLE SEAT MILES (ASMs)
Quantifiable, regularly published data regarding available seat miles for an airline can be obtained from each airline's annual report/10-K and from *Airline Executive International*. This data is reported by the millions. By analyzing the airline's available seat miles compared to its RPMs, it can be determined how the carrier is doing in filling its seats or how much revenue it's losing.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

Airline Statistics. (1991, March). Airline Executive International, pp. 48-49.

FACTOR
AVERAGE AIRCRAFT UTILIZATION (FLIGHT HOURS)
Quantifiable, regularly published data regarding the number of scheduled flight hours can be obtained from the National Transportation Safety Board and the Research & Special Programs Administration (RSPA) and from each airline's annual report/10-K.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

Select statistics for top U.S. scheduled air carriers. (1990). Washington, D.C.: National Transportation Safety Board.

FACTOR
NUMBER OF CONSUMER COMPLAINTS (PER 100,000 PASSENGERS)
Quantifiable, regularly published data regarding the number of consumer complaints can be obtained from the Airline Economics, Inc. as reported in *Aviation Daily* and the U.S. Department of Transportation's *Air Travel Consumer Report*. Data is reported by the number of complaints per month, the number of passengers, and the number of complaints per 100,000 passengers per carrier for each month.

SOURCES: Office of Consumer Affairs. (1991, March). Air Travel Consumer Report. Washington, DC: U.S. Department of Transportation.

Rankings of U.S. carriers consumer complaints. (1990, October). Aviation Daily, p. 58.

FACTOR
% OF AIRCRAFT OWNED VS. % LEASED
Quantifiable, regularly published data regarding the percentage of owned versus the percentage leased can be obtained from each airline's annual report/10-K and from the FAA database. The focus is on the percentage of aircraft owned by the airline. The higher percentage of owned aircraft, the more operator control the airline has.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports/Form 10-K.

Hutchinson, John, & Smith, Barbara K. (1990). FAA data base - phase II research project (NIAR Report 90-31). Wichita, KS: Wichita State University, National Institute for Aviation Research.

FACTOR
COMMENT CARDS
Comment cards were requested from each airline; these comment cards are a method for passengers to voice consumer opinions. The response time with regards from each airline to respond to the request for the cards and the concern and empathy to comment cards turned into the airline is a source of measurement of service quality. Questions to be answered for this factor include (1) are they available? (2) does the airline respond to comment cards? (3) what is the response time? (4) does the airline show concern, empathy to passengers' comments? (5) does the airline provide a solution to passengers? Content analysis should be done on each airline's comment cards.

SOURCES: Ten U.S.-based major airlines. (1990). Request for Airline Comment Cards..

FACTOR
APPEARANCE/CLEANLINESS OF AIRCRAFT/AIRPORT FACILITIES
This is a Service Quality Indicator and is important to consumers but quantifiable data is not readily available to the public on this factor.

FACTOR
LOW COST AIR FARES
This Service Quality Indicator is important to some consumers but quantifiable data is not easily available to the public on this factor. Regularly published data regarding air fares are not readily available since fares can and often do change daily since deregulation. Low cost air fares can be an important service factor to some passengers - but they usually have to "work at it" in order to obtain the lowest fare available.

FACTOR
"FAIR" PREMIUMS AT ONE-CARRIER DOMINATED HUBS
There has been much discussion of late on this subject, and while it may be an important Service Quality Indicator to some consumers, there isn't much quantifiable data readily available to the public on this factor. However, the number of hubs per carrier could be a factor; the carrier could then offer more choices for non-stop flights.

FACTOR
CONCENTRATION OF TRAFFIC/CONGESTION
This is a Service Quality Indicator and is important to consumers because it definitely affects on-time performance, but quantifiable data is not readily available to the public on this factor. However, instrument landing capabilities at a particular hub plus data on Air Traffic Control capability/ workload could be indicators of the concentration and congestion of traffic.

FACTOR
LAYOFFS
This is a Service Quality Indicator and is important to consumers because it can affect reliability of service quality, but regularly published data is not readily available to the public on this factor. One question to answer is whether the airline is on a union "hit list."

FACTOR
IN-HOUSE MAINTENANCE CAPABILITY
This is a Service Quality Indicator and is important to consumers because it can affect reliability of service quality (equipment breakdowns, redundancy, etc.). Some data may be reported in some airlines' annual reports, but regularly published data is not readily available to the public on this factor and so is difficult to measure.

FACTOR
INNOVATIVENESS
This is a Service Quality Indicator and is important to consumers because it can affect reliability of service quality, but regularly published data is not available to the public on this factor and so is difficult to measure. An indication of innovativeness may be apparent in some airlines by reading their annual reports.

FACTOR
DIFFERENTIATION
Again, this is a Service Quality Indicator and is important to consumers because it can affect reliability of service quality by attracting customers, but regularly published data is not available to the public on this factor and so is difficult to measure.

FACTOR
ARTICULATION AGREEMENTS WITH COMMUTER AIRLINES
This is a Service Quality Indicator and is important to consumers because it can affect reliability of service quality by making schedules and routes more convenient for customers. Some data may be included in the airlines' annual report, but regularly published data is not available to the public on this factor. However, the airline's preference of owning its own commuter and keeping operation control versus articulation agreements with commuters can affect the service quality of an airline.

SOURCES: Hutchinson, John, & Smith, Barbara K. (1990). FAA data base - phase II research project (NIAR Report 90-31). Wichita, KS: Wichita State University, National Institute for Aviation Research.

Ten U.S. - based major airlines. (1990). Annual reports/Form 10-K.

FACTOR
QUALITY OF MANAGEMENT
This is a Service Quality Indicator and is important to consumers because it can affect assurance of service quality; however, it's a very subjective indicator and difficult to measure. The style and quality of management can be somewhat ascertained from various magazine/newspaper articles written about airline CEOs. The percentage of employee ownership can affect the service quality of an airline; for example, the higher the percentage of ownership of an airline by employees might indicate higher levels of service since the employees have a vested interest in the operation of the airline. Some possible means to indicate the quality of management might be by flight attendant/pilot union ratings, the number of training programs available and implemented, etc.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports.

FACTOR
AWARDS
This is a Service Quality Indicator and is important to consumers because it can indicate assurance of service quality; however, it's a very subjective indicator and difficult to measure. Some awards received by an airline may be reported in an airline's annual report.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports.

FACTOR
PLEASANT, COMPETENT EMPLOYEES
Again, this Service Quality Indicator is important to consumers because it can indicate assurance of service quality; however, it's a very subjective indicator and difficult to measure. However, like the quality of management factor, the percentage of employee ownership can influence the attitude of employees and the quality of service they provide to passengers. Union sanctions might also be a factor influencing the quality of employees and the level of service provided.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports.

FACTOR
AIRLINE'S ABILITY TO ATTRACT AND KEEP TALENTED EMPLOYEES
This Service Quality Indicator is also important to consumers because it can indicate assurance of service quality; however, it's a very subjective indicator and difficult to measure.

FACTOR
CATERING TO WOMEN
This Service Quality Indicator is becoming more and more important to women passengers as they travel more for business. At this time, there is not much quantifiable, regularly published data on this factor; however, there have been a few articles written regarding women passengers. This is an important factor for airlines to consider in order to provide empathy to all customers. By expanding and upgrading the business class sections of their aircraft, airlines are providing better service to women. Whether they are including businesswomen's needs in this upgrade remains to be seen.

FACTOR
IN-FLIGHT SERVICES
This Service Quality Indicator is important to consumers because it can indicate empathy of service quality. In-flight services include types of meals served, expenditures on passengers' food, high-tech entertainment, etc. However, regularly published data is not available to the public for this factor.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports.

FACTOR
PERCENTAGE OF PASSENGERS FLYING FIRST CLASS
Regularly published data regarding the percentage of passengers flying first class may not be published regularly, but there have been reports listing the percentage from time to time in articles and in airline's annual reports. First class passengers are an important source of revenue for airlines; the higher the percentage, the more empathy the airlines should be able to provide to all passengers.

SOURCES: Ten U.S.-based major airlines. (1990). Annual reports.

FACTOR
HANDLING OF COMPLAINTS
This is a Service Quality Indicator and is important to consumers because it can signify assurance of service quality; however, it's a very subjective indicator and difficult to measure. However, one possible method to measure this indicator is by the use/non-use of customer comment cards. For example, are comment cards readily accessible to passengers? What is the response time to passengers' comments on comment cards when received by the airline? Does the airline demonstrate concern, empathy, willingness to help the passenger and/or do better in the future?

SOURCES: Ten U.S.-based major airlines. (1990). Comment Cards.

APPENDIX B

FREQUENT FLIER CLUBS

TABLE 10

FREQUENT FLIER CLUBS

Minimum for two round-trip tickets (in thousands of miles)

	Domestic		Hawaii		Europe		Min. miles per flight
	Coach	1st	Coach	1st	Coach	1st	
America West FlightFund 800-247-5691	40	80	60	120	120	200	750
American Airlines AAdvantage 800-433-7300	40	80	60	120	80	200	500
Continental Airlines OnePass 800-525-0280	35	75	45	100	55	140	Continental 500
Delta Airlines Frequent Flyer Program 800-323-2323	60	85	70	100	110	150	1000
NorthWest Airlines WorldPerks 800-447-3757	40	80	60	80	60	110	750
Pan Am WorldPass 800-348-8000	40	70	40	80	60	80	500
Southwest 800-531-5601	18	NA	NA	NA	NA	NA	See note*
TWA Frequent Flight Bonus Program 800-421-4815	40	80	60	120	60	175	750
United Airlines Mileage Plus 800-421-4655	40	80	60	120	80	200	500
USAir Frequent Traveler Program 800-872-4738	40	60	NA	NA	100	200	750

*Note: Southwest awards the first free ticket for 10 round trip tickets purchased and the second free ticket for the next 8 round trip tickets purchased. For comparative purposes the average trip length, as reported by Southwest Airlines, was 502 miles in 1990. Consequently, approximately 18000 miles are traveled for an award of two free round trip coach tickets.

APPENDIX C

AIRLINE QUALITY EXPERT SURVEY

(Telephone Interview)

Name_____ Date & Time_____

Job Title_____ Organization_____

Expertise Category_____
Phone and Address [record on call sheet]

[Pre-Announcement: Interviewer]

"Hello, this is _____ calling from Wichita, Kansas. The National Institute for Aviation Research at Wichita State University is conducting research to better identify attributes which contribute to a consumer's view of a quality airline. We would appreciate the use of the next ten minutes to gather your opinions and draw on your expertise.

Given your unique perspective, we would like to switch the tables a bit, and ask that you rate the importance of several attributes as you feel an average consumer might. We are asking that you use your professional expertise to think like a consumer.

I will read the attribute and ask that you rate its importance to the average consumer on a scale of 1 to 10, with 10 being of great importance and 1 being of low importance.

Please allow me to read the first attribute:

[Interviewer: {if necessary} Prior to each item say, **"on a scale of 1 to 10, how do you feel consumers would rate the importance of ..... as an indicator of airline quality?"**]

Note: 1=low imp.,10=great imp., 0=not important, 11=no response. Begin each survey with a different item. Place a check mark by each first item. If asked, confidentiality is assured.

Score	Factor
_____1.	The average age of an airlines' fleet
_____2.	The number of aircraft (size of an airlines' fleet)
_____3.	On-time performance
_____4.	Consumer complaints regarding flight problems such as planned or unplanned delays, cancellations, or misconnections
_____5.	Oversales, denied boardings "bumping" due to over booking
_____6.	Consumer complaints of mishandled baggage including lost, delayed, or damaged baggage
_____7.	Consumer complaints regarding fares, including fare increases, overcharges, and discount fare conditions and availability
_____8.	An airlines load factor (number of seats filled versus those available)

_____A. Financial stability of an airline

_____9. Operating Margin

_____10. After-Tax Profit Margin

_____11. Return on Assets

_____12. Return on Equity

_____13. Long-Term Debt to Equity Ratio

_____14. Total Debt to Total Assets Ratio

_____15. Earnings per Share (EPS)

_____16. Price to Earnings (P/E) Ratio

_____17. Average seat-mile cost for an airline

_____18. Total revenue passenger miles flown by an airline

_____19. Available seat miles for an airline

_____20. The % of aircraft owned by an airline vs. the % of those leased by an airline

_____21. Pilot deviations per airline (these are pilot actions which may result in the violation of a federal air regulation.)

_____22. Number of accidents (accident history) per airline

_____23. Average aircraft utilization or flight hours per airplane for an airlines fleet

_____24. Ability to earn frequent flier awards for low miles

_____25. Percentage of consumer complaints filed per 100,000 passengers with the Dept. of Transportation

_____26. Number of consumer complaints regarding customer service (includes rude or unhelpful employees,inadequate meals, cabin service, or treatment, etc.)

_____27. Consumer complaints regarding refund policies for unused or lost tickets or for fare adjustments

_____28. Consumer complaints in areas such as frequent flyer problems, airport facilities, security, and cargo problems

_____29. Ticketing and boarding complaints registered by consumers (airline or travel agent mistakes in reservations, ticketing, etc.)

_____30. Complaints about an airlines' chartered tour operations

_____31. Consumer complaints about unfair, misleading or offensive advertising

_____32. Consumer complaints regarding smoking policies either for or against

_____33. Consumer complaints about an airlines' credit policies or incorrect billing

_____34. The availability of customer comment cards being made available to all passengers.

[Post-Announcement: Interviewer]

That completes our survey. Thank you for your participation. Do you have any questions or comments?

Results will be published in the National Institute for Aviation Research's Research Monograph Series and other academic journals as accepted.

Would you like to have a copy of the report when published?
_____Yes _____No

Do you want us to mail you a complementary catalog of NIAR Reports?
_____Yes _____No

If Yes: Interviewer, check call list, and verify address.

If a respondent wants further information they should contact:

Dr. Brent Bowen
National Institute for Aviation Research
Wichita State University-Campus Box 93
Wichita, KS 67208-1595
(316)689-3678

Interviewer Signature_____Date_____

APPENDIX D

DATABASE SEARCHES DURING THE LITERATURE REVIEW PROCESS

LITERATURE REVIEW DATABASE SEARCHES

LUIS

Used to find bibliographic, call number, and location information for materials held by the Wichita State University libraries.

ABI/INFORM

Designed to meet the information needs of executives and covers all phases of business management and administration. Approximately 800 primary publications in business and related fields are currently scanned for inclusion in ABI/INFORM.

INFO-TRACK

A CD/ROM database covering more than 435 popular magazines and providing extensive coverage of current affairs, the performing arts, business, sports, recreation and travel, consumer product evaluations, science and technology, leisure-time activities, and other areas. In addition to general reference, INFO-TRACK serves business and government libraries with information not available on any other online database.

TRADE & INDUSTRY INDEX

Business journals relating to trade, industry, and commerce are indexed and selectively abstracted in TRADE & INDUSTRY INDEX. This database provides indexing and selective abstracting of over 300 trade and industry journals as well as comprehensive but selective coverage of business and trade information from nearly 1,200 additional publications.

MARCHIVE

A computerized version of the U.S. Government Printing Office (GPO) Monthly Catalog of United States Government Publications.

PTS PROMPT (Predicasts Overview of Markets and Technology)

PTS PROMPT abstracts all significant information appearing in thousands of newspapers, business magazines, government reports, trade journals, bank letters, and special reports throughout the world.

EDUCATIONAL RESOURCES INFORMATION CENTER

A nationwide information network approaching 700,000 records used for acquiring, selecting, abstracting, indexing, storing, retrieving, and disseminating significant and timely education-related reports.

DISSERTATION ABSTRACTS INTERNATIONAL

A definitive subject, title, and author guide to virtually every American dissertation accepted at an accredited institution since 1861. In addition, citations for thousands of Canadian dissertations and an increasing number of papers accepted abroad are included in the database.

KANSAS REGENTS DATABASE

Provides access to the on-line computer library catalog systems for the Kansas Regents Universities.

FAA DBASE

A compilation of all the world's civil aircraft above 3000 lbs. GW. Developed and administered by the National Institute for Aviation Research and the Federal Aviation Administration.

TABLE 11

SEARCH DESCRIPTORS

CUSTOMER RELATIONS-AIRLINES	AIRLINE OPERATIONS
CUSTOMER COMPLAINTS-AIRLINES	AIRLINE FINANCE & ECONOMICS
AIRLINE QUALITY	AIRLINE SERVICE QUALITY
AIRLINE MARKETING & MANAGEMENT	AIRLINE CUSTOMER SERVICE
AIRLINE SERVICE	FREQUENT FLIER PROGRAMS
FLIGHT DELAYS	MISHANDLED BAGGAGE
OVERSALES & OVERBOOKED	MEASUREMENT OF QUALITY

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