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IMPACT OF FREQUENT FLYER PROGRAMS ON THE DEMAND FOR AIR TRAVEL

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ABSTRACT

Liberalization of the airline industry has lead to increased competition among the carriers for an expanding market of air travelers. This paper aims to identify the factors that affect the airline specific demand. The demand for the air services of Singapore Airlines (SIA) is examined in particular using binary choice models. The most important factor in influencing an individual's choice of SIA is the convenient schedule of SIA relative to other airlines. The other significant variable is membership in the Krisflyer frequent flier program (FFP), which has a small but positive (as compare to schedule convenience) impact on SIA's market. The sample is classified into different market segments: business versus leisure travel, long haul versus short haul travelers, Krisflyer FFP members versus non-Krisflyer FFP members, and FFP members versus non-FFP members. There seems to be an overall variation among the segments in each classification.

INTRODUCTION

As the global airline market inches towards liberalization, the forces of competition has lead to intense and constant realignments of loyalties between airlines, various forms of partnerships arrangements and cooperative schemes, such as code sharing agreements resulting in competitive fares, and changes in frequency of services and other attributes which are aimed at capturing market share and increasing profits. Frequent Flyer Programs (FFPs) is one such innovation introduced to induce and capture loyalty of travelers. FFPs offer free travel and upgrades as

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incentives to fly with an airline and is the most popular and successful marketing strategy devised to build customer loyalty and sell the high priced seats. The introduction of FFPs grew by 50% in less than half a decade (Bhagwanani, 2000). There are at least 100 airlines without FFPs but who have forged FFP links with one or more operators, particularly signing with at least one major airline partner. There are to date over 700 such FFP links.

FFPs are designed to achieve a high degree of brand loyalty particularly among business travelers, attract primary demand, effectively discourage new carrier competition, and give airlines direct and efficient communication links with their best individual customers (Brancatelli, 1986; Stephenson & Fox, 1987). The growth in air passengers will depend on the state of the global economy, population growth and the increase in income and wealth of individuals. Airline marketing officials claim that FFPs boost the carrier's business by 20 to 35 percent (Stephenson & Fox). However, traffic volumes can only increase across the board if total airline industry business traffic increases. Since corporate air travel is a derived demand business, it is highly improbable that FFPs will stimulate 20 to 35 percent growth. This is only possible if business travelers made billions of dollars worth of unnecessary air travel.

Unnecessary business trips can happen when a business traveler is a FFP member who gets to choose the airline and redeem the mileage earned on business trips for his or her private use while the company pays the fare. The business person might be better off choosing a regular air service that cost more due to a higher class of services or longer routes but saves on unnecessary travel under a FFP. It is also possible that an increase in traffic and revenue is a result of diverted travelers from other airlines. The relative impact of FFPs on traffic diversion and demand for air travel compared with other factors such as fare changes, a stronger economy, a growing population, and acquisition of another airline, have not been explored. One other interesting issue is whether FFPs are designed to protect (rather than expand) market share, revenues and profit erosion as a result of FFPs of other airlines. One way of ascertaining the impact of an airline's FFP on market-share is to examine the effect of FFPs on airline specific demand and choice. The following sections examine the literature on the demand for air travel and an empirical analysis of the impact of FFPs (its own and other airlines) on the demand for Singapore Airlines (SIA).

THE IMPACT OF FFPS ON AIR TRAVEL

Most surveys of individuals who belong to at least one FFP concerning airlines with FFP reveal that FFPs influence their choice of airline. For

example, Toh and Hu (1988) reported that 67% of FFP members agreed that membership in a FFP influenced their choice of airline. Morrison and Winston's (1989) model of joint airline and route choice using a sample of origin and destination data of individual trips showed that FFPs had a significant effect upon airline and route choice. Nako (1990) also found that FFPs had a significant effect on airline choice. However, FFPs are not the most important factor. The number of flights and the frequency of delays appear to have the strongest effect upon airline choice, followed by the percentage of direct flights, total travel time, FFPs, fares, and, finally, on-time performance. Except for on-time performance, the rankings in order of importance of these factors seem to be consistent with Toh and Hu (1988) findings where schedule convenience, on-time performance, low fare, and overall service by attendants are of greater importance in influencing their choice of airlines than FFPs. Business travelers gave a higher ranking to FFPs (Nako, 1990).

Factors Affecting the Demand for Air Travel

The growth in air traffic is accelerated by the falling price of air transport and an increase in economic activities. Falling airfares and rising personal incomes have also lead to an increase in the demand for leisure trips. Globalization, accelerated economic growth, liberalization of trade and the natural growth in population have had a positive impact on the demand for business travel. The demand for airline services is dependent on the volume of air traffic on a route. Factors affecting demand on specific routes include the relative attractiveness of tourist destinations, the relative price of goods, the relative cost of holidays, the exchange rates and the extent of migration, which can result in increased air travel to visit far-away friends and family. The nature of industrial and commercial activities at an airport's hinterland influences the volume of business traffic. The pattern and growth of demand of any route are affected by the economic and demographic characteristics of the markets at either end of the route.

Supply side factors such as frequency, seat availability, departure and arrival time, and number of en route stops influence the distribution of demand between competing carriers and play a significant role in affecting the airline specific demand. The demand for air travel is a function of the generalized cost of travel, that is, fare and time spent on utilizing the services. A carrier will attract passengers if it can offer a noticeable reduction in the elapsed time. This consists of (a) airport access time, (b) flight time, (c) waiting time and (d) boarding time. Other airline service attributes specific to the carriers that influence passengers' preferences include safety records, airline experience, in-flight service, fleet type and whether the airline is the flag carrier of the traveler's country of origin.

Factors Affecting the Effectiveness of an FFPs

Network coverage of air service provided

A business traveler will find it easier to accumulate FFP mileage if an airline covers most of his business destinations or has good coverage through alliances and partnerships with other airlines.

Airline's market share

Nako (1990) decomposed the effects of FFPs into an airline specific effect (which is measured by a membership variable, whose coefficients are positive and significant) and a hub effect (interactive term). The estimate of the interactive term indicates that an increase in an airline's airport market share by 10% enhances the value of the FFP by US $4.80. The effectiveness of a FFP is enhanced with the rise in the airline's presence in the city in which the participating members resides.

Duration and distance of flights

The effectiveness of a FFP increases with total travel time since travel time is positively correlated with the amount of mileage credit that may be earned on a specific trip. The positive sign of the coefficient of the interaction between fares and FFP membership provides some evidence that FFP members are less fare sensitive than non-FFP members.

Characteristics of an individual FFPs

The characteristics of the airline's services affect the effectiveness of its FFPs. However, FFPs are packaged differently. The success of a FFP grows in line with the number of members it can attract. It is not the absolute benefits but the relative gains compared to that of the other carriers that matter to individual travelers. In designing the awards scheme, one has to keep in mind the targeted group. The structure of the award and benefit system differs from airline to airline due to the difference in characteristics of the target group.

The first structural component lies in the ease in redeeming travel awards, this includes the class of service, the bonus for travel in first and business class, and the type of fares that qualify for point accrual. The second structural differentiator is the partner network inclusive of hotel, car rental and other retail chains. The third element centers on the terms and conditions that determine the flexibility of the reward system which consists of covering the validity of miles, booking procedures, blackout dates, transferability of awards and the capacity provided for award travel. The fourth element of the program is customer service. The last structural

factor is the elite program, catering to that essential customer segment of frequent high-yield travelers.

One rationale behind a FFP is to award free trips to the frequent flyers on seats that would not have otherwise been taken. This is to minimize revenue lost. This argument is weak because many FFP members do use the free tickets for trips they would have paid for. Other FFP members sell their free-ticket coupons to ticket brokers. In each case airlines lose revenue. The above revenue displacement phenomenon is prevalent in open-ended programs where the flyer does not have to use their mileage points by a certain date.

Most studies have focused on estimating the demand for the U.S., North Atlantic and European markets using aggregated data. This study estimates the demand for air travel by air travelers (foreign and local) in Singapore with the aid of disaggregated data. Factors affecting the demand include airfare, income, population, airlines' image, FFPs' quality of service in terms of frequency of flights, and load factors. The studies conclude that market share of the airline has an impact on the effectiveness of the airline's FFP on residents living near to an airport. However, does the FFP in turn affect the airline's market share? If so what is the impact?

FFPS AND AIRLINE CHOICE

Random surveys were conducted between December 18 and December 20, 2000, at several strategic locations in Singapore such as shopping centers, the financial district and popular tourist attractions. There were 192 successfully completed surveys. All respondents must have flown in the past twenty months with SIA within their choice set of airlines. A short haul traveler is defined as one whose origin or destination is any city in Asia, Australia or New Zealand to or from Singapore. If the traveler's origin or destination was further he or she would be classified as a long haul traveler. A business traveler is one who travels for the purpose of work regardless of who pays for the fare. Otherwise, he or she is a leisure traveler.

Descriptive Statistics

About 56% of the respondents are between the ages of 25 to 45 years old and are business travelers compared to only 35% of the leisure travelers who are 35 years old and younger. Business travelers (54%) earn more than S$9,000 a month as compared to leisure travelers (21%). Most business travelers are from the IT (12%) and banking and financial sectors (12.%), electronics (9%), manufacturing (6%), chemical (6%) and shipping (4.6%). Others include real estate, warehousing, food catering, legal, and

advertising. Table 1 shows that the 34% of travelers travel to or from Europe followed by 33% to or from Asia, Australia and New Zealand, Americas, Middle East and South Africa.

Table 1. Origin and Destination of Travelers Responding to FFP and Airline Choice Survey

Region	*Percent*
North & South America	10
Europe	34
Middle East & South Africa	4
Australia & New Zealand	19
Northeast Asia	14
Southeast Asia	11
West India	9

There were an equal number of long haul business (LB), short haul business (SB), long haul leisure (LL) and short haul leisure (SL) travelers. Over 50% of all business travelers surveyed were based in Singapore. This may be one of the reasons why 71% of the SB travelers chose SIA. Some travelers fly about 9 times a year with SIA. Half (50%) are members of the Krisflyer FFP. The average SB traveler is a member of more than one FFPs (1.7) and gave the highest rating of importance to FFPs (3.4 out of 5.0). The SB traveler sample has the largest proportion of members in the FFPs of other airlines (besides SIA, and Star Alliance and OneWorld carriers) and FFPs of the flag carrier of their own country of origin or residence. About 60% focus on just one FFP.

The highest proportion of LB travelers chose airlines recommended by their companies and fly with the flag carriers of their country of origin or country of residence. This group has the largest proportion of members in FFPs of a Star Alliance carrier (48%) and the flag carrier of their country of origin . A small number belong to FFPs associated with OneWorld carriers (16%). At least 79% of business travelers are FFP members while only 46% of leisure travelers belong to at least one FFP. These percentages are higher than Toh and Hu's (1988) estimate of 72% for business travelers and 23% for leisure travelers.

FFP Membership Profile

Of the 192 respondents, 127 belong to at least one FFP. About 60% of the FFP members earn more than S$84,000 annually while only 20% of non-members exceed this amount. Toh and Hu (1988) found that 72% of FFP members, compared to 34% of non-FPP members, earn more than US$40,000 (S$69,200) per year. A higher proportion of the FFP members

Table 2. Types of Airlines Chosen and Participation in Frequent Flier Programs (FFPs), by Type of Traveler

	Long-haul Business	*Short-haul Business*	*Long-haul Leisure*	*Short-haul Leisure*	*All*
Percent based in Singapore	58	52	13	25	37
Number of trips per year on Singapore Airlines	3.06	9.10	1.33	1.06	3.64
Choice of airline					
Singapore Airlines	38	71	50	38	49
Flag carrier of traveler's country of origin	44	23	31	28	31
Flag carrier of traveler's country of residence	44	50	33	31	40
Carrier recommended by employer or travel agent	52	27	29	20	32
Participation in frequent flier programs					
Concentrates in only one FFP	56	60	35	40	48
Number of FFP memberships	1.42	1.73	0.73	1.19	1.27
Importance of FFPs	2.7	3.4	1.7	2.3	2.5
Krisflyer member	35	50	15	19	30
STAR Alliance member	48	33	27	44	38
ONEWORLD member	17	35	19	46	30
Member of other FFPs	35	42	27	29	33

(32%) are either CEOs or owners of business. A higher proportion of FFP members (60%) compared to non-FFP members (31%) travel on business. This is similar to the findings of Toh and Hu. About 79% of business travelers are FFP members while 53% of leisure travelers are FFP members. This is higher than the 72% and 23% in the corresponding group estimated by Toh and Hu.

A higher percentage of FFP members (54%) make short haul trips compared to non-FFP members (47%) and have a higher average number of trips made per year (16; see Table 3). Only 30% of FFP members choose airlines recommended by travel agency or their company while 35% of non-FFP members took the advice. The average airfare of FFP members is S$2,354, which is higher than that of non-FFP members of S$1,835. Toh and Hu (1988) also found that FFP members tend to travel more often short distance (an average of 17 trips per year), pay higher fare and rely less on travel agencies. About 45% of all FFP members fly with the flag carrier of their country of residence as compared to only 29% of the non-members. The higher proportion of FFP members choosing SIA seems to positively

correlate with the higher proportion of FFP members living in Singapore 39% versus 32%, respectively).

Table 3. Characteristics of Travelers, by Frequent Flier Program (FFP) Membership

	FFP members	*Non-FFP members*
Business traveler	59	31
Long-haul traveler	46	63
Number of trips per year	16.02	3.21
Uses carrier recommended by travel agent or employer	31	35
Average price of airfare	S$2353.79	S$1834.71
Uses flag carrier of traveler's country of origin	31	31
Uses flag carrier of traveler's country of residence	45	29
Singapore Airline passenger	32	43
Singapore resident	39	32
Singapore resident and citizen	45	34

About 64% of the FFP members interviewed belong to two or more programs. This is marginally larger than 61% estimated in Toh and Hu's study (1988). About 30% (27% in Toh and Hu) participate in three or more FFPs. However, only 2%, as compared to 17% in Toh and Hu's survey, joined four or more FFPs. This is probably due to more domestic air travelers taking advantage of FFPs of U.S. domestic airlines. On average a FFP member in our sample belongs to 1.92 FFPs. FFP members on average give a rating of 3.81 (out of 5.00) to the importance of FFPs in affecting their choice of airline.

There is a positive correlation index of 0.15 between the number of FFPs enrolled in and the importance of FFPs. A similar correlation is observed between the strategy of concentrating in one FFP and rating the importance of a FFPs. This confirms Toh and Hu's finding that FFP members enroll in multiple programs but concentrate in one. The importance of FFPs will determine how FFP membership affects one's choice of airline. Over 40% of this sample do not belong to any FFP from either the Star Alliance or OneWorld, while 7% join FFPs of both the Star Alliance and OneWorld. A majority of FFP members belong to FFPs of at least one of the major alliance carriers. A large portion of the major alliance FFP members chose to concentrate their mileage among carriers within one alliance. This may

imply that a FFP member of a Star Alliance carrier has a higher likelihood to opt for a SIA flight than one belonging to another alliance.

Table 4. Characteristics of Travelers, by Membership in Frequent Flier Programs (FFPs)

	FFP member	*Krisflyer member*	*FFP member but non-Krisflyer member*	*Non-Krisflyer member*
Type of travel/traveler				
Business traveler	na	70	49	39
Long haul traveler	na	44	51	56
Number of trips per year	na	11.5	19.3	11.9
Singapore resident	na	49	23	29
Singapore resident and citizen	na	54	23	30
Choice of Airlines				
Singapore Airlines	na	7.00	2.63	2.24
Flag carrier of traveler's country of origin	71	68	75	34
Flag carrier of traveler's country of residence	70	74	65	38
Carrier recommended by employer or travel agent	na	32	32	32
Average price of airfare	**na**	**0.280702**	**0.338028**	**0.325926**
Participation in frequent flier programs				
Concentrates in only one FFP	72	74	73	38
Importance of FFPs	3.8	3.8	3.7	2.0
Number of FFP memberships	1.92	2.05	1.70	0.93
Star Alliance FFP member	57	86	60	30
OneWorld FFP member	43	39	39	25
Membership of other airlines' FFPs	50	40	55	30

The behavioral and attitudinal profile of Krisflyer members were analyzed with respect to three other groups of respondents, namely all FFP members, non-Krisflyer members and members of other FFPs except Krisflyer. Since the second group , non-Krisflyer members, includes many non-FFP members the percentage of this group differs with the rest of the three significantly (see Table 4). A Krisflyer member on average belongs to 2.05 FFPs, this is higher than the overall average of 1.92. A vast majority of Krisflyer members join at least one other FFP with 54% of the Krisflyer members joining two other FFPs.

Over 50% of the FFP members join FFPs of Star Alliance carriers. This percentage is larger than those who join the FFP of OneWorld (42%). A relatively lower percentage of Krisflyer members belong to the FFP of OneWorld compared to 42% of non-Krisflyer members. Almost 40% of

the sample that are members of Krisflyer belong to FFPs of other Star Alliance airlines but are not members of FFPs of OneWorld airlines, while only 15% of Krisflyer members belong to FFPs of OneWorld but not Star Alliance carriers. An overwhelming proportion of FFP members are members of FFPs of the flag carriers of their country of residence (69%). This percentage is approximately the same as those joining FFPs of the flag carrier of their country of origin. This percentage is higher among Krisflyer members. Being a resident of Singapore is an important factor in influencing an individual's decision to join the Krisflyer FFP.

A majority of FFP members felt that concentrating on one FFP would

difference among airfare of the same class across airlines is the concern. The difference in airfare between airlines is assumed to be independent of the class of travel.

4. In many instances, an airline is chosen just because it has been recommended by the travel agency or by company travel policy. For around-the-world holiday trips, the travel agencies normally offer their customer a package of air services (usually provided by airlines within an alliance) consisting of trips to different countries. From another point of view, it seems to become a comparison of alternative alliances instead of individual airlines. This is classified as long haul leisure trip as the price paid is for a package of air service instead of individual airfares. This price is compared with that of other similar packages. To a leisure traveler, schedule and time are not the top considerations, thus they may not even bother to gather information that differentiates between the alternative airlines' schedule and flight duration from one point to the other. Believing that paying a packaged price for a bundle of services is more economical in terms of monetary cost and information collecting cost, these holiday travelers will just choose among the available packages instead of individual airlines. The decision to fly from one point to another throughout the journey is made by the travel agencies who would usually purchase seats from major airlines in order to gain bulk discounts. And major airlines usually provide service of the same general quality. Hence the differentiating factor among airlines will lie in their network of marketing outlets and their membership in major alliance. A business traveler may be required to choose from the list of airlines recommended by his company. Schedule is his top priority. Hence recommendation is the conditional, if not the critical factor, in the choice of airline for business trips.

5. There are Krisflyer members who meet the membership requirement at the margin, but are not enjoying benefits significant enough to make him or her put much weight on FFP membership in their choice of airline. Due to the different trip frequency and travel behavior, FFPs will benefit different individuals at varying degrees. Hence, FFP members place varying weights on the importance of FFPs in their choice of airline.

6. If the FFP member's strategy is to concentrate his or her mileage on one FFP which happens to not be the Krisflyer FFP, he or she will probably prefer the airline(s) associated with the other FFP over SIA This assumes that mileage earned on SIA cannot be easily transferred over to the other FFP, which seems to be the case in spite of the airlines' claim of transferability. Thus the maximum strategy is to earn the mileage, as much as possible, from the airline from whose FFP one desire to redeem benefits.

7. The coefficient estimated under the b-logit instead of the b-probit assumption is displayed due to the slightly better fit of its index, under the logit model.

8. As the sample size becomes larger the t-statistic approaches the z-statistic. And the p-value gives the probability of a type one error. A p-value of less than 0.1 indicates that the estimate is significant at a 10% level.

9. Reject null hypothesis $b_{11} = 0$. Test statistics of 2.02 is significant at the 10% level.

10. The likelihood ratio estimated statistics (5 df) = 127.6846 is χ^2 distributed. It is significant at the 10% level.

11. Discounted SIA airfare may be cheaper. The perception by travelers that SIA is a premium airline commanding premium fares may deter them from including SIA in their choice set. This may help explain the negative specific constant for SIA.

12. Test of overall variation across the long and short haul markets with a test statistics of (5 df) = 8.5844 which is χ^2 distributed. It is significant at the 10% level.

13. The above definition is more useful in comparing two specifications developed from the exact same data. $[K/OK-1)][\rho^2/(1-\rho^2)]$ is approximately F distributed with (K-1, K) degree of freedom under the null hypothesis that B = C.

14. Test statistics (15 df) = 31.90914 which is χ^2 distributed.

15. $\bar{p}^2$ increases further to 0.17 and 0.08 when only two variables SCHEDULE & QFFPCON are specified.

16. $\bar{p}^2$ Increases from 0.08 to 0.19 for FFP members and from 0.14 to 0.25 for non-FFP members.

17. For each segment (type of travel and length of travel) the weights will be half as there are equal number of respondents surveyed for each segment. When divided into four segments (LB, BB, LL,SL) the weight will be one quarter.

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