

Parallel Frequent Flier Program Partnerships: Impact on Frequency

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Abstract

Frequent flier program (FFP) partnerships on the US market appear more parallel than complementary. Such partnerships have a potential to make partners' products closer substitutes, leading to fiercer price competition. One response of partners to such a threat to profits may entail lowering cost. Our analysis finds that an airline competing with a partner offers 10-30 percent lower frequency of service as compared to otherwise similar markets where the airline does not have any partnership with its competitors.

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JEL Codes: L13, L29, L40, L93

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1. Introduction

This paper analyzes effect of frequent flier program (FFP) partnerships between the major US carriers on frequency of service. We postulate that since FFP partnerships make airlines' services more substitutable, potentially leading to fiercer price competition; a natural response by the carriers will be to cut costs, which can lead to lower frequency of service on routes where partner airlines compete. We find support for this contention in the data.

About a decade ago, airline companies on the US market started employing a new strategy: that of partnering with their competitors. These partnerships consisted of code-sharing agreements (including partner airlines' flights into your schedule), as well as near unification of frequent flier programs. Frequent-flier program (FFP) partnerships have been almost a default feature of international airline alliances; joining the frequent flier programs is in this case a way to reinforce the complementary alliances between the carriers².

On the other hand, benefits of domestic FFP partnerships for US carriers are not as obvious. Even though US carriers may not be directly competing on many non-stop routes (since most large network carriers have their hubs in different airports), they do compete on many city-pair markets. So, FFP partnerships between the US carriers appear more parallel than complementary (with the exception of alliances involving carriers operating on Alaska and Hawaii markets).

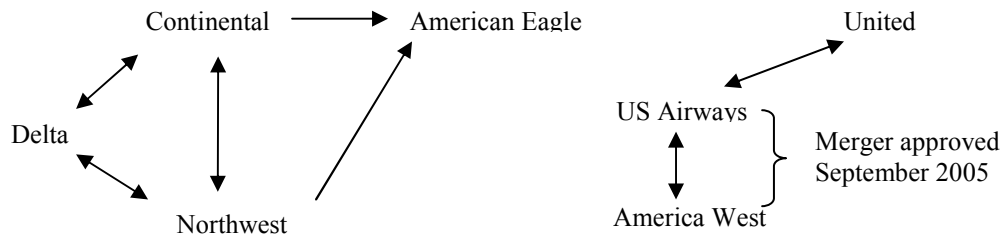
As Lederman (2008) correctly points out, such partnerships are likely to increase the substitutability between partner airlines' services, which is not a result carriers would be happy with. Moreover, the practice of domestic FFP partnerships has survived up to now, as can be seen from Figure 1. American Airlines is currently the only major network airline in the US staying out of partnering with other US carriers³. We therefore wonder whether there is any way in which carriers can actually benefit from parallel

² Being able to earn and (especially) redeem miles for international flights with the partner airlines increases the value of the airline's frequent flier program to domestic customers. A business traveler could now redeem miles earned traveling domestically with, for example, Delta, for a vacation abroad to locations where Delta does not fly but its partners do.

³ While Continental and Northwest customers can earn miles on a limited number of American Eagle's services to/from Los Angeles international airport, American Airlines does not allow its frequent fliers to earn or redeem AAdvantage® miles on flights by any other US carrier.

frequent flier program partnerships, even though such are likely to reduce the substitutability between their services.

It is possible that the carriers join their frequent flier programs to compete with other similar airline partnerships. In this case, a consumer choosing between two joint frequent flier programs may value the one which gives him/her more earning and redemption options higher. This may positively affect joint market share of the partner airlines. Yet, fiercer price competition between the partner airlines due to higher substitutability between their services can lead to adverse consequences for carriers' profits. One should keep in mind that while airlines on the US domestic market can form partnerships and join their frequent flier programs; they are not allowed to jointly set prices or frequency of service.



Excludes largely complementary partnerships with Alaska and Hawaiian. Continental-American Eagle and Northwest-American Eagle partnerships are limited to selected routes and not reciprocal (American Eagle customers cannot earn/redeem miles on Continental or Northwest)

Figure 1 FFP Partnerships involving US network carriers (as of June 2006)

Source: Airlines' web-sites; the structure of partnerships remains as of October 2008; however, America West merger with US Airways has been completed, and Delta-Northwest merger is in progress.

When your revenue can take a hit due to fierce price competition, your natural response will be to cut your costs. A cost cutting strategy that could be seen in the data is reduction in frequency of service. We further suggest that such a strategy will be easier to implement when your competitor is also your partner. Data analysis shows that airlines offer (10 to 30 percent, depending on the specification employed) lower frequency on routes where they compete with carriers with whom they have a frequent flier program partnership, as compared to markets where airlines that have no partner relationships compete.

Prior empirical analysis of FFP partnerships can be found in works by Mara Lederman. Lederman (2007) examines to what extent FFP partnerships on US domestic

market are parallel and how they affect demand. She finds that, first, partnerships do increase earning and redemption opportunities for some passengers; and second, partnerships appear to affect partners' demand positively (airline's market share at an airport increases with an increase in size of operation by the partner carrier). This finding is not inconsistent with fiercer price competition between partner airlines due to increased substitutability. Lederman (2008) shows that airline flying into an airport dominated by a certain carrier can gain from partnering with that dominant airline. This paper provides a simple direct assessment of effect of domestic FFP partnerships on airlines' strategies and shows that those partnerships adversely affect convenience of service.

Also related to our work are studies of airline consolidation on the U.S. domestic market. This growing literature yields no clear consensus as to whether such partnerships benefit consumers. Bamberger et al. (2004) and Ito and Lee (2007) document lower prices following domestic code-sharing agreements and suggest consumers did benefit from consolidation. However, Armantier and Richard (2005) and Whalen (2005) suggest ambiguous competition effects, while Armantier and Richard (2006) find that consumer surplus actually fell as a result of the Northwest – Continental alliance. All these studies look at the price effects of airline partnerships.

The rest of the paper is organized in the following straightforward way. Section 2 reports the data analysis results. Section 3 concludes.

2. Empirical Analysis

The data for our analysis comes from databank T100 Segment, collected monthly by the US Department of Transportation and publicly available at the Department's web site. This dataset provides information on (among other things) frequency of service at the airline-airport-pair-market level.

To focus on peak travel period with stable configuration of airline partnerships, we chose July of 2004 for our analysis. The frequent flier program partnerships scheme presented on Figure 1 has been established around 2002 and remained largely intact ever since (it is interesting that airline mergers in the US industry have up to now occurred within that framework). Focusing on the peak travel month of the year with robust demand for air travel (July 2004), we effectively look at the time period where airlines have little incentive to reduce frequency, making the data work against us, so to speak.

We included into our analysis only those airport-pair markets on which two or more carriers offered non-stop services (for a total of 393 markets); this allows for the direct comparison of frequency choices on markets where partners compete versus routes where airlines without partner relationships are the competitors. Our observations are at the airline-airport-pair-market level; with regional carriers'⁴ services lumped with those of the corresponding major carrier. We ended up with 874 observations. Natural logarithm of carrier's frequency is the dependent variable.

The variable of interest is PARTNER dummy, taking value of 1 if a carrier with which the airline has a frequent flier program partnership is also offering non-stop service on the same airport-pair market. As a clarifying example, consider Boston-Los Angeles airport-pair market. On this route, non-stop services in July of 2004 were performed by American Airlines, United Airlines and America West Airlines. Since United had a FFP partnership with America West; the PARTNER variable will take on value of one for observations for United and America West, and zero for observation corresponding to American Airlines. Our model suggests coefficient on this variable should be negative and significant. Of 393 airport-pair-markets included into our analysis, partner airlines compete on 102; PARTNER dummy takes on value of 1 for 206 cases, or in almost quarter of all observations.

The set of control variables we employ is standard and includes carrier dummies; carrier-hub⁵ indicator variables; natural logarithm of distance; geometric averages of endpoints' metropolitan areas population and per capita income; and quantity (not frequency) based airport-pair-market Herfindhal-Hirschman index (HHI). The latter is

⁴ On the US market, some of the commercial passenger services (particularly on thinner markets) are performed by so-called regional carriers, effectively operating as agents of major airlines. Those can be either independent companies (SkyWest, Atlantic Southeast); or fully owned subsidiaries of major carriers (American Eagle). Several such airlines perform services for more than one major airline (e.g., SkyWest flies as Delta, United, and Midwest agent). Where a regional carrier was known to perform flights for more than one major airline, classification was made according to the hub airport to/from which the service was performed; airlines sharing hub airports have not been found to share a regional carrier.

⁵ The main airline-hub combinations are: Chicago O'Hare, Dallas-Ft. Worth and Miami for American Airlines; Houston Intercontinental, Newark and Cleveland for Continental Airlines; Atlanta, Salt Lake City and Cincinnati for Delta Air Lines; Memphis, Minneapolis, and Detroit for Northwest; Denver, Chicago O'Hare, Washington Dulles and San Francisco for United Airlines; Philadelphia, Charlotte and Pittsburgh for US Airways; Phoenix and Las Vegas for America West; Phoenix and Chicago Midway for Southwest Airlines.

also instrumented by the number of airlines offering non-stop service due to its potential endogeneity with the explanatory variable.

Table below presents results of the following specifications. First, we report OLS regression with White robust standard errors; then, two-stage least squares results with number of carriers as the instrument for HHI are presented; finally, regression with airport-pair-market fixed effects to control for unobservable market-specific heterogeneities is shown. Note that all airport-pair-market controls we used are absorbed by fixed effects; therefore, the only control variables available in that specification are airline and airline-hub indicator variables, coefficients on which we do not report to save space. It is evident from the table below that there is support for our hypothesis in the data: when a partner airline serves a market, carriers tend to lower their frequency of service. The size of the effect, however, varies; fixed effects regression suggests effect that is three times that implied by OLS and two stage least squares specifications. In either case, the magnitude of the impact is non-trivial. As an illustration, consider an airline offering three daily services (21 weekly flights) between two airports. Our results suggest that, other things equal, upon joining its frequent flyer program with that of a competitor on the same route, our hypothetical carrier will adjust its schedule from operating three flights on weekdays and only two services on the weekend (OLS estimate) to dropping the third flight altogether – maybe flying three times only on one of the days of the week (fixed effects estimate).

Control variables exhibit expected behavior: frequency is higher on thicker markets and on those where consumers have deeper pockets; longer routes are associated with lower frequency of service, other things equal; and airlines choose lower frequency of service on more concentrated markets. These outcomes are consistent with theoretical study by Brueckner and Flores-Fillol (2007), as well as with empirical evidence by Pai (2008), and Bilotkach, Fageda, and Flores-Fillol (2008). It also pays to note that airline-hub interactions, not reported in the table, all have positive and significant (with exception of that for Continental Airlines) coefficients associated with them.

Table 1 Estimation Results

Regressor	OLS	Two Stage LS	Fixed Effects
Constant	6.1403** (0.3133)	6.2931** (0.3277)	5.2708** (0.0919)
PARTNER	-0.1003* (0.0572)	-0.1095** (0.0578)	-0.2951** (0.1296)
Log(Distance)	-0.3089** (0.0325)	-0.3141** (0.0323)	-----
Geometric Average of Population	8.22E-08** (1.18E-08)	7.49E-08** (7.29E-06)	-----
Geometric Average of Per Capita Income	3.10E-05** (7.15E-06)	3.22E-05** (7.29E-06)	-----
HHI	-0.8840** (0.1986)	-1.1771** (0.3103)	-----
Adjusted R-Squared	0.3601	0.3576	0.4717

Notes:

1. Dependent variable is natural logarithm of frequency, at airline-city-pair-market level
2. Number of observations – 874
3. White heteroscedasticity-consistent standard errors are reported
4. All regressions include airline dummies and airline-hub interactions, which are not reported
5. Variables absorbed by airport-pair-market fixed effects are not reported
6. Statistical significance: ** - 5 percent; * - 10% percent

4. Concluding Comments

At the first glance, it appears airlines should derive little benefit from alliances involving frequent flier program partnerships on the US domestic markets. Since fare coordination by alliance members is illegal, and partners compete on a number of city-pair markets (even though not necessarily with non-stop services), one can suspect that FFP partnerships may lead to consumers perceiving airlines’ services as closer substitutes as compared to the case without such a partnership. This may lead to fiercer price competition and lower revenue. We however suggest that partner relationships may enable the airlines to respond to this higher substitutability by reducing costs, which can be reflected in the data via lower frequency on routes where an airline competes with a partner as opposed to otherwise identical markets where the same airline’s competitors do not have any partner relationships with it.

The data analysis finds support for the alleged effect of frequent flier program partnerships on frequency choice by airlines on the US market. Competing with a partner, the airline will offer 10 to 30 percent fewer flights as compared to otherwise similar markets where the airline does not have any partnership with its competitors. This is obviously a sizeable effect, the one which clearly has the potential of outweighing

any possible gains to consumers due to fiercer price competition. Coupled with some evidence suggesting airline partnerships on the US market could have had anti-competitive price effects, our study suggests adverse price effects of parallel airline partnerships can be exacerbated on the product quality side. This is an issue that regulators should take into account when evaluating future proposed partnerships in airline and potentially other industries.

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