Hub Dominance and Pricing

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January 21, 1999

I am a Professor of Business Economics at the University of California at Berkeley and Director of the University of California Energy Institute. I have studied the U.S. airline industry since 1977. In 1978 and 1979, during the time of airline deregulation, I was a staff economist at the U.S. Civil Aeronautics Board. I have published numerous scholarly articles on the industry and have acted as a consultant to state governments, U.S. federal government agencies, and a number of U.S. airlines. My curriculum vitae is attached. I have been asked to address this committee on the subject of airline fares at hub airports. I am not being paid by any company or government organization to participate in this discussion.

Some Simple Price Comparisons Among Airports

I have prepared two tables that compare prices at various airports. Table 1 presents a comparison of prices at each of the thirty busiest U.S. airports with national average prices. This is done by comparing the price paid by passengers on each route to and from a given airport with the average price for all similar-distance routes in the U.S. Thus, for instance, the first number in the Atlanta row, 31%, indicates that in 1984, the average price to fly to or from Atlanta on a trip of some given distance, was 31% greater than the average price of all trips in the U.S. of approximately the same distance. A detailed description of the construction of the data in this table is given in the appendix.

Table 1 indicates that prices at Pittsburgh, for instance, have gradually increased relative to the national average from 1984 to 1997. While Pittsburgh passengers paid close to the national average prices during the mid-1980s, the average ticket price for travel to or from Pittsburgh is now among the highest in the country.

Table 2 focuses directly on the prices of the largest airlines at the most concentrated major airports in the country. It presents the same type of comparison of prices to the national average for same-distance routes, but examines only the prices of one carrier at the airport. The details of the construction of this table also are included in the appendix. The dominant airline at many hubs charges prices far above the national average,

including American at Dallas/Ft. Worth, Northwest at Minneapolis, USAir at Charlotte and Pittsburgh, and Delta at Cincinnati. At other hub airports — Baltimore, Denver, Salt Lake City, and St. Louis, for instance — dominant carriers charge prices much closer to the national average.

Tables 1 and 2 indicate that a busy airport or a hub airport need not *necessarily* result in high prices. While lower prices are to some extent related to the business/tourist mix of travel – a point I address further below – that is unlikely to explain the relatively low prices at St. Louis, Baltimore and many other cities not generally thought of primarily as tourist destinations. It also does not explain the change in relative prices over time at an airport, such as the decline in prices at Las Vegas since America West, a low-price airline, set up a hub there.

When I have presented tables similar to these in the past, some hub-dominant carriers and their defenders have raised a number of critical points. Let me address some of the most common:

1. *These figures do not include frequent flyer bonus trips, which are free or nearly free.* Of course, if all airports had the same proportion of such free trips this would not change the comparison among airports. It is plausible, however, that more free bonus trip involve dominated hub airports. Northwest, for instance, has stated that 7.5% of its Minneapolis traffic travels on free tickets. While I cannot verify this directly, if it is true then it would represent a larger percentage of free tickets than at most other airports. The industrywide share is about 5%. This difference, however, could explain at most a difference of approximately 2.5% in the prices I calculate. To see why this is so, note that if I increased the total number of passengers at MSP by 7.5% while increasing the total revenue at MSP by zero (since these are free tickets) that would lower the average MSP price by about 7.5%. But, if I increased the passengers at all other locations by 5%, that would lower the average price elsewhere by about 5%. The *difference* in average prices would decline by only about 2.5 percentage points.

2. *There are more business travelers at dominated hubs than elsewhere, which skews the average fare.* I have seen no hard data supporting this assertion, other than the fact that a higher proportion of passengers at dominated hubs buy tickets without the usual discount tickets restrictions: advanced purchase and minimum stay. Of course, this information can also be interpreted quite differently: Carriers having significant market power at their

dominated hubs may simply make fewer discount tickets available and thereby force travelers to buy more-expensive, less-restricted tickets. Many business travelers do not buy "business fares." The proportion who do depends on the availability of restricted discounts tickets and the price break that can be gained by abiding by the ticket restrictions.

Even if there are more business travelers at dominated hubs than elsewhere, one must ask why that justifies a higher average fare. Business travelers are not *inherently* more expensive to serve. Business tickets are associated with a higher quality of service, in particular, greater last-minute availability of seats. That service can be costly to provide because it requires the airline to hold seats out for last-minute travelers and often have those seats go unused. If high prices at dominated hub airports are justified by the high-cost of providing last-minute availability to business travelers, then this would be reflected in lower load factors on flights at these airports than elsewhere.[1] In fact, load factors at hub airports tend to be higher, not lower, than the national average.

3. *Higher fares are justified by higher quality service, more frequent flights in particular.* The simple response to this is essentially the same as to point 2. In *competitive* markets, prices are driven by costs, not by the value consumers get from the product. By the reasoning of this comment, personal computer prices should have skyrocketed over the last decade since they are now much better in practically every way than they were ten years ago. Instead, they PC prices have fallen dramatically because there is vibrant competition in that market.

There is nothing wrong with hubs. Hubs do indeed provide benefits to consumers who live in the hub cities or people who want to travel to those cities. But just as with PCs, consumers shouldn't have to pay extra for those benefits unless they cost extra to produce.

4. *Airlines couldn't be acting anticompetitively, because the bottom line shows that they don't make high profits.* This response has become a bit more muted lately. Still, the underlying logic of it is just wrong. Just as firms in very competitive industries can still make profits by being more efficient producers, firms in less competitive industries can fail to make money by being inefficient. The unit cost differences between airlines that

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[1] For instance, prices are lower than average to such tourist destinations as Florida and Hawaii, but load factors on these flights are generally well above industry average.

cannot be explained by differences in operating characteristics is enormous.[2] For a long time, a number of carriers around the country said that Southwest-style efficient operations couldn't work in their location. That was before Southwest entered the west coast and then the northeast. Now airlines are trying to figure out how to emulate Southwest with at least some of their operations by setting up low-cost subsidiaries.

In the early 1990s, many carriers lost huge sums, a fact that they point to frequently in their defense. In the late 1980s, however, these same carriers had purchased record numbers of new aircraft in the belief that (a) the economy would continue to grow without a recession, and (b) it was important to establish hubs everywhere possible before other carriers did. They were wrong on both points and paid for it dearly. The 1990-92 recession caused them to park many of the new aircraft in the desert, where they generated only costs, not revenues. They also learned that smaller cities couldn't economically support hub operations. These were costly mistakes that generated huge losses, but they were management errors, not a sign that the industry is sufficiently competitive.

Competitive Advantages of a Hub-Dominant Airline

Though the numbers I have presented do not demonstrate *conclusively* that there is a lack of competition at some dominated hubs, that inference deserves serious attention. Scholarly work by myself and many other researchers has supported the hypothesis that a dominant airline at a hub airport can exercise market power, raising prices above cost by a greater amount than occurs at more competitive airports.[3] The U.S. Departments of Justice and Transportation, and the U.S. General Accounting Office, have explicitly recognized this "hub-dominance effect" in their work.[4] I believe that frequent-flyer programs (FFPs), travel agent commission override programs (TACOs), and corporate discount programs (CDPs) are the most significant causes of this hub dominance effect.

I'm sure that all members of this committee are familiar with FFPs. It is worth pointing out, however, that the marginal value of FFP miles increases with the number

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[2] I have not seen a recent study that estimates these differences, but Caves, Christensen and Tretheway, 1984, find unexplained differences of up to 40%.

[3] See, among others, Levine, 1987, Borenstein, 1989 and 1990, Werden, Joskow, and Johnson, 1991, Evans and Kessides, 1993, and Abramowitz and Brown, 1993

[4] See, for instance, USGAO, 1988, 1990a, and 1990b, and USDOT, 1990.

of miles that a flyer collects on a certain carrier. This is not only because the free travel that can be purchased with miles increases more than proportionally, but also because other perks – including use of lounges, free upgrades, and extra FFP miles for each paid trip – are given to travelers who collect a lot of miles on one carrier. Ask any resident of Minneapolis, Pittsburgh, Denver, Atlanta, or Dallas and they will almost certainly be able to explain how FFPs have "locked" them into the local dominant carrier, often despite their strong dislike for that carrier. It is also important to remember that FFPs gain much of their impact from the "principal-agent problem" they create: the bonus is paid to the traveler, but the cost of the ticket is often incurred by some other party, such as the traveler's employer.

TACOs are effectively "frequent-booker" programs for travel agents. A typical program offers a travel agency the standard commission up to the point that it books, say, 70%, of its airline traffic (or traffic on some selected set of routes) on the offering carrier. If the agency exceeds the threshold, it gets an extra commission – usually in the 1% to 5% range. In most cases, the bonus commission is "back to the first dollar" of revenue that agent has booked on the carrier during the time period, meaning that the agent gets a significant lump-sum bonus for hitting the target as well as higher marginal reward for additional bookings on that carrier. TACOs can be and are structured very intricately: a carrier might require, for instance, that in addition to hitting the overall share target, an agent must also book with that airline at least 85% of the traffic it tickets on certain specific routes where it faces competition. TACOs also rely on a principal-agent problem: travel agents choose among alternative tickets for their customers based not just on the customer's preferences, but also based on their own commission. Some travel agent's deny this, but anonymous polls of agents have shown that more than half admit to choosing carriers for their clients based on TACOs.[5]

Corporate Discount Programs also leverage the dominance of an airline in a city by linking discounts to the breadth of the corporation's use of the carrier. A typical CDP might require the corporation to book at least 80% of its travel in certain city-pair markets on the offering carrier in order to get a discount on all travel with the carrier. These programs too can be carefully targeted. I'm aware of cases in which a carrier has instructed its sales people to withhold discounts on a certain set of routes unless the

[5] See *Travel Weekly*, 1988.

company is willing to commit to booking all or nearly all travel with it on another set of routes.

All of these programs allow carriers to leverage their dominant position at an airport, tying together travel on different routes and at different times in a way that prevents new entrants from gaining a foothold by entering on just one or a few routes. Thus, these programs create a significant barrier to entry that allows hub-dominant carriers to retain their dominant positions.

Empirical work by myself and others has demonstrated that, controlling for fares and level of service on an individual route, hub-dominant carriers attract a disproportionate share of the traffic that *originates* in the hub city in comparison to traffic on the same routes that originates at the other endpoint of these routes.[6] Clearly, an airline that serves only one or a small set of routes cannot match such programs.

Furthermore, my work has shown that the hub-carrier preference is much stronger among travelers in business-oriented markets than in leisure-oriented markets, consistent with the view that FFPs and CDPs are a significant part of the explanation.[7] Since business travelers are the most lucrative, denying entrants a fair shot at attracting them makes it extremely difficult for an entrant to be competitive.

In a world with FFPs, TACOs, and CDPs, a smaller carrier can overcome the advantages of a larger airline that uses these marketing devices only by either (a) having a much more cost efficient operation, or (b) creating a scale of operations at the hub that rivals that of the dominant carrier. Competition, however, benefits consumers most when a firm requires only the smallest cost advantage (taking into account all true economic costs) in order to displace a rival. If an entrant must have a large cost advantage in order to compete successfully, this lowers the chance of entry even when the entrant is more efficient and, thus, allows the incumbent firm to act with less market discipline by, for example, charging supracompetitive prices.

Similarly, if real economic scale economies favor a larger firm, then the market process will push firms in that direction. However, when firms are encouraged or required to expand their scale for reasons not related to real economies, the result is likely to harm

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[6] See Borenstein, 1991, and Kahn, 1993.

[7] See Borenstein, 1991.

consumers. Such an incentive can cause firms to grow beyond their optimal cost-efficient scale. Greater size of operations can create diseconomies due to managerial complexity and incentive problems that grow with the size of the operation. More important, a small carrier is likely simply to forego entry into such markets where large scale operations are necessary to be competitive, which harms consumers if this barrier to entry is not truly cost based.

Even if these marketing devices give a hub-dominant incumbent a competitive advantage, a smaller carrier might still be able profitably to serve high-density routes from the hub by focusing on the passengers least affected by these programs. In particular, the small entrant might be able to be a profitable niche player on high-density routes. Of course, because the entrant is precluded from a certain share of the traffic by the hub carrier's marketing programs, the market must have sufficient traffic that the entrant can support reasonably frequent service without those passengers. Thus, even with FFPs, TACOs and CDPs, a small carrier may still be able to operate profitably, and steal traffic from the incumbent, on the densest routes from the hub. The small carrier, however, still would be unlikely to enter less dense routes even if it could offer more efficient service than the incumbent, because the marketing programs would prevent it from attracting sufficient traffic to operate economically.

Pro-Competitive Justifications for Airline Repeat-Buyer Programs

In discussions with industry personnel and economists, I have heard two alternative explanations for FFPs, TACOs, and CDPs. Since these are likely to come up in discussion of these programs, I will address them here.

1. *These discount programs are justified by economies of scale or scope. As the airline carries more passengers, its unit costs decline. Thus, these are like any other bulk discounts.* This argument is wrong on the economics. In only a few cases of CDPs with huge corporations does the change in scale due to one agreement appreciably affect unit costs of the carrier. For nearly all of these agreements, the quantity of travel affected is trivial compared to the scale of the carrier's operations. Thus, there is not a cost justification for these discounts. Furthermore, these programs are not like standard bulk discounts. They are *share* based, not quantity based. Sometimes the share basis is explicit: the buyer must give x% of its business to the airline to get the discount. In other cases, they are only im-

plicitly share based: the airline looks at the buyer's travel expenditures from the previous year and sets a dollar target that is a high proportion of the firm's travel expenses.[8]

2. *These discount programs are a form of non-linear pricing that can be efficient.* This comment is right on the economics, but completely unsupported by the airlines. The idea is that prices above marginal cost reduce quantity sold below the efficient level. The seller would like to sell every unit that is valued above its marginal cost of production, but would also like to earn higher revenues on the inframarginal units it sells. Non-linear pricing can accomplish this. While this is all true, in the many airline investigations, mergers, and antitrust cases I have worked on, I have never seen a document that eluded to non-linear pricing in order to encourage marginal efficient sales. On the other hand, I have seen many documents that refer to using these programs to leverage the carrier's strength on certain routes to maintain control of other routes on which the carrier faces stronger competition.

Predatory Practices

I understand that part of the mandate of this committee is to review the DOT's proposed guidelines for review of predatory practice allegations. I have read the proposed guidelines and would like to make a few comments on them, and relate them to my concerns about the repeat-buyer programs I have discussed above. I think the proposed guidelines make a real effort to address what is probably a real problem: predatory practices by incumbent airlines intended to force entrants out of the market. I think it is quite plausible that some of the recent cases of possible predation that have appeared in the press are in fact just that: predation. Yet, in the end, I do not believe that the proposed guidelines would allow the DOT to effectively distinguish predatory behavior from legitimate competitive response. Strict enforcement of the proposed guidelines might very well catch some airlines engaged in predation, but it would also catch airlines who are acting competitively, and it could have a chilling effect on competition. That is not to say that a problem doesn't exist, but that these guidelines are unlikely to have the intended effect.

More importantly, however, the guidelines would be much less important if there were not significant barriers to entry and practices that put new entrants at a competitive

[8] To analyze this, simply ask the carriers if the dollar revenue targets that they set for corporate clients are influenced by the total travel expenditures of the corporations. I'm certain that the dollar discount targets that Northwest Airlines sets for 3M Corporation are not the same as for some small manufacturer that spends only one million dollars per year on air travel.

disadvantage. Predation relies on barriers to entry to be economic, because without such barriers, recoupment is unlikely to be achievable. If the anticompetitive effects of the repeat-buyer programs were eliminated, I think that the need for predation guidelines would diminish greatly, because the most significant barriers to entry at most airports would disappear. In the absence of the cross-market tying that these programs create, new entrants would be able to compete on a route-by-route basis. Faced with that sort of competition and low barriers to entry, I doubt that carriers would find it profitable to attempt predation.

Appendix: Construction of Data in Tables 1 and 2

The data presented in tables 1 and 2 and constructed from the U.S. Department of Transportation's Databank 1A, which is a 10% random sample of all tickets collected by U.S. airlines during a quarter. The data used cover every quarter from 1984:1 to 1997:4. The D.O.T.'s Databank 1A is the primary source of information on actual prices of tickets sold. It is used by government, academic, and industry analysts.

From each quarter of the Databank 1A, the following tickets are eliminated from the analysis of prices:

1. Any ticket that includes a destination or change-of-plane point outside the U.S.
2. Any ticket that is not either a one-way or round-trip itinerary, *e.g.,* open-jaw or circle trip tickets.
3. Any ticket that includes more than four coupons (each time a passenger changes flights, a new coupon is collected).
4. Any ticket that includes more than two coupons for an origin to destination trip, *i.e.,* any itinerary in which the passenger changes planes more than once as part of traveling from an origin to a destination.
5. Any ticket that requires changing airlines (interlining), as well as flights, as part of an origin to destination trip.
6. Any ticket with a fare of less than $10. These are usually "non-revenue" passengers, including both frequent-flyer bonus tickets and employee (and family) free travel. Unfortunately, all airlines do not treat and report these tickets in the same way.
7. Any ticket with a fare greater than four times the D.O.T.'s Standard Industry Fare Level (SIFL) for the origin-to-destination distance of travel. These are assumed to be keypunch errors.

After eliminating these tickets, the remaining round-trip tickets are treated as two directional trips, one in each direction, with each directional trip costing half the ticket price. Using all of these "split" round-trip tickets and all remaining one-way domestic tickets, the average fare in every 50-mile distance category is calculated. For instance, the average fare in the 551-600 mile category is calculated by counting the total number of origin-to-destination passenger trips in this category and adding up the total revenue collected for those trips. The average price in the 551-600 mile category is then the total revenue divided by the total number of passenger trips. This is done for every 50 mile category.

To calculate the price premium at a given airport, all passenger trips to or from the airport are collected and the price for each trip is compared to the average price for trips in the same distance category. The actual calculation is most easily demonstrated with an example:

Assume there were only two trips to or from airport XXX during a given quarter, one from XXX to YYY, a distance of 371 miles for which the passenger paid $191, and one from ZZZ to XXX, a distance of 593 miles, for which that passenger paid $424. Assume that the average price for all U.S. trips in the 351-400 mile category during the quarter was $195 and the average price in the 551-600 mile category was $350. Then the total amount paid by passengers at XXX, $191+$424=$615, would be greater than the total amount these passengers would have paid if they had been charged the national average price for the trip in the same distance category as theirs, $195+$350=$545. $615 is 13% greater than $545, so the price premium at XXX would be 13% during that quarter. To calculate the premium during an entire year, the sum of actual prices paid are added together for the four quarters and then compared to the sum of the prices that would have been paid for these flights if each passenger had been charged the national average price during the same quarter for the relevant distance categories. By this process, the data for Table 1 are created. The same basic approach is used for creating the data for Table 2, except that the only tickets that are compared to the national average are the tickets for trips on the specified airline that are to or from the specified airport.

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TABLE 1

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Albequerque	-0.28	-0.26	-0.25	-0.23	-0.23	-0.29	-0.29	-0.26	-0.27	-0.24	-0.17	-0.19	-0.22	-0.19
Atlanta	0.31	0.29	0.24	0.17	0.23	0.19	0.17	0.23	0.19	0.18	0.11	0.12	0.05	0.08
Baltimore	0.03	0.04	0.03	0.02	0.04	0.09	0.10	0.09	0.12	0.03	-0.12	-0.10	-0.09	-0.14
Boston	0.01	0.01	0.01	0.02	0.05	0.06	0.06	0.08	0.11	0.11	0.10	0.14	0.14	0.17
Charlotte	0.27	0.08	0.12	0.15	0.20	0.25	0.21	0.27	0.32	0.36	0.26	0.56	0.60	0.55
Chicago - O'Hare	0.15	0.12	0.16	0.16	0.11	0.13	0.14	0.08	0.11	0.18	0.11	0.13	0.18	0.20
Cincinnati	0.26	0.08	0.11	0.22	0.25	0.28	0.36	0.28	0.27	0.38	0.41	0.54	0.53	0.49
Cleveland	0.18	0.10	0.06	0.09	0.02	0.13	0.17	0.14	0.11	0.07	-0.04	0.07	0.16	0.10
Dallas - DFW	0.07	0.10	0.08	0.11	0.16	0.18	0.22	0.16	0.13	0.25	0.31	0.25	0.29	0.27
Dallas - Love Field	-0.40	-0.38	-0.34	-0.33	-0.33	-0.40	-0.46	-0.41	-0.43	-0.44	-0.37	-0.35	-0.33	-0.33
Dayton	0.23	0.16	0.18	0.23	0.22	0.19	0.24	0.16	0.11	0.18	0.07	0.23	0.41	0.30
Denver	-0.15	-0.15	-0.20	0.00	0.00	0.05	0.11	0.04	0.04	0.07	0.04	0.07	0.11	0.02
Detroit	0.05	0.06	0.07	0.01	-0.04	-0.03	-0.01	0.02	0.09	0.13	0.19	0.14	0.19	0.13
Ft. Lauderdale	-0.04	-0.02	-0.04	-0.06	-0.09	-0.08	-0.14	-0.06	-0.04	-0.10	-0.15	-0.09	-0.16	-0.18
Hartford	0.14	0.09	0.08	0.08	0.06	0.11	0.08	0.11	0.11	0.17	0.21	0.17	0.22	0.24
Honolulu	-0.15	-0.09	-0.09	-0.08	-0.17	-0.19	-0.19	-0.18	-0.20	-0.24	-0.22	-0.26	-0.28	-0.29
Houston - Hobby	-0.31	-0.31	-0.26	-0.18	-0.12	-0.20	-0.22	-0.19	-0.24	-0.23	-0.21	-0.18	-0.18	-0.17
Houston - Intercon	-0.09	-0.07	-0.05	0.00	0.10	0.13	0.14	0.13	0.10	0.14	0.11	0.12	0.19	0.17
Indianapolis	0.19	0.11	0.07	0.04	-0.04	-0.05	-0.03	-0.06	-0.02	-0.01	-0.05	-0.07	-0.06	-0.06
Kahului	-0.09	-0.02	-0.06	-0.03	-0.15	-0.18	-0.18	-0.15	-0.16	-0.18	-0.13	-0.17	-0.20	-0.19
Kansas City	-0.04	-0.03	-0.11	-0.16	-0.19	-0.20	-0.14	-0.14	-0.13	-0.16	-0.13	-0.17	-0.16	-0.18
Las Vegas	-0.17	-0.14	-0.16	-0.23	-0.25	-0.27	-0.27	-0.30	-0.29	-0.31	-0.28	-0.31	-0.36	-0.33
Los Angeles	-0.07	-0.05	-0.08	-0.06	-0.05	-0.06	-0.06	-0.08	-0.08	-0.09	-0.10	-0.12	-0.13	-0.11
Memphis	0.34	0.32	0.37	0.32	0.29	0.20	0.29	0.27	0.26	0.31	0.39	0.32	0.35	0.35
Miami	-0.05	-0.05	-0.07	-0.11	-0.09	-0.10	-0.14	-0.09	-0.01	-0.04	-0.07	-0.07	-0.07	-0.04
Minneapolis	0.08	0.06	0.05	0.13	0.12	0.12	0.27	0.21	0.21	0.20	0.39	0.32	0.42	0.37
Nashville	0.26	0.24	0.14	0.09	0.09	0.03	0.01	0.08	0.08	0.17	0.23	0.07	0.00	-0.05
New Orleans	-0.06	-0.06	-0.11	-0.12	-0.06	-0.11	-0.15	-0.10	-0.09	-0.10	-0.10	-0.09	-0.07	-0.08
Newark	-0.23	-0.24	-0.20	-0.07	0.00	0.10	0.10	0.11	0.10	0.04	-0.01	0.09	0.11	0.13
NYC -- JFK	0.01	0.05	0.08	0.01	0.01	0.02	0.02	-0.01	0.00	-0.01	-0.03	-0.01	0.03	0.02
NYC - La Guardia	0.06	0.07	0.06	0.04	0.05	0.08	0.09	0.13	0.14	0.15	0.14	0.21	0.28	0.29
Oakland	-0.19	-0.13	-0.08	-0.10	-0.10	-0.14	-0.20	-0.26	-0.27	-0.32	-0.31	-0.35	-0.33	-0.30
Ontario	-0.06	-0.07	-0.07	-0.09	-0.09	-0.14	-0.13	-0.19	-0.21	-0.22	-0.20	-0.23	-0.23	-0.22
Orange County	0.03	0.03	0.02	0.06	0.09	0.09	0.11	-0.01	0.02	0.02	0.01	0.01	0.05	0.01
Orlando	-0.06	-0.07	-0.09	-0.14	-0.13	-0.11	-0.16	-0.10	-0.07	-0.11	-0.12	-0.14	-0.16	-0.22
Philadelphia	0.10	0.13	0.15	0.11	0.11	0.11	0.10	0.15	0.22	0.25	0.20	0.21	0.27	0.29
Phoenix	-0.18	-0.20	-0.22	-0.27	-0.27	-0.29	-0.28	-0.26	-0.26	-0.26	-0.21	-0.24	-0.25	-0.21
Pittsburgh	0.15	0.16	0.17	0.06	0.05	0.13	0.16	0.23	0.29	0.30	0.40	0.39	0.43	0.47
Portland, OR	0.02	0.02	0.09	0.02	0.02	0.04	0.04	0.04	0.00	-0.11	-0.11	-0.19	-0.23	-0.20
Salt Lake City	0.08	0.00	0.01	0.03	0.14	0.11	0.16	0.13	0.10	-0.06	-0.13	-0.21	-0.25	-0.20
San Antonio	-0.12	-0.12	-0.11	-0.15	-0.13	-0.19	-0.21	-0.21	-0.19	-0.16	-0.12	-0.11	-0.15	-0.13
San Diego	-0.15	-0.13	-0.13	-0.14	-0.17	-0.20	-0.17	-0.20	-0.23	-0.24	-0.21	-0.23	-0.22	-0.20
San Francisco	-0.02	-0.01	-0.01	0.00	-0.01	-0.03	-0.03	-0.08	-0.06	-0.07	-0.04	-0.05	-0.03	-0.01
San Jose	-0.03	-0.08	-0.13	-0.10	-0.02	0.05	0.06	0.03	0.03	-0.03	-0.13	-0.14	-0.18	-0.15
Seattle	0.05	0.03	0.07	0.05	0.06	0.07	0.09	0.05	-0.02	-0.09	-0.10	-0.14	-0.17	-0.14
St. Louis	0.10	0.05	0.03	0.09	0.04	-0.01	-0.04	-0.07	-0.13	-0.11	-0.07	-0.10	-0.01	-0.01
Tampa	0.01	0.00	-0.02	-0.06	-0.05	-0.05	-0.12	-0.03	-0.01	-0.05	-0.11	-0.07	-0.16	-0.16
DC - National	-0.01	0.00	-0.06	0.01	0.08	0.11	0.16	0.16	0.16	0.20	0.18	0.10	0.20	0.19
DC - Dulles	0.09	0.12	0.07	0.05	0.07	0.09	0.11	0.14	0.16	0.18	0.23	0.25	0.30	0.30
West Palm Beach	-0.03	-0.01	-0.01	-0.04	-0.06	-0.05	-0.13	-0.06	-0.03	-0.07	-0.11	-0.09	-0.11	-0.13

TABLE 2

		1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Atlanta	DL	0.35	0.39	0.39	0.26	0.33	0.33	0.40	0.34	0.32	0.33	0.28	0.41	0.21	0.21
Baltimore	US	0.04	0.01	-0.02	0.02	0.08	0.12	0.15	0.14	0.21	0.11	-0.07	0.04	0.05	-0.01
Charlotte	US	0.26	0.07	0.13	0.14	0.20	0.26	0.24	0.28	0.36	0.36	0.25	0.59	0.69	0.62
Chi -O'Hare	UA	0.25	0.20	0.24	0.24	0.18	0.15	0.18	0.11	0.15	0.18	0.12	0.14	0.22	0.25
Chi -O'Hare	AA	0.22	0.22	0.29	0.29	0.23	0.21	0.17	0.09	0.11	0.23	0.15	0.15	0.19	0.20
Cincinnati	DL	0.24	0.19	0.25	0.33	0.30	0.28	0.37	0.28	0.30	0.37	0.42	0.64	0.60	0.51
Denver	UA	-0.09	-0.12	-0.19	0.02	0.05	0.07	0.13	0.09	0.08	0.09	0.07	0.12	0.19	0.07
Detroit	NW	0.08	0.14	0.15	0.10	0.05	0.05	0.09	0.10	0.18	0.22	0.34	0.25	0.29	0.22
DFW	AA	0.13	0.23	0.16	0.19	0.27	0.29	0.30	0.22	0.16	0.29	0.38	0.31	0.35	0.35
Houston -Inte	CO	-0.12	-0.13	-0.10	0.01	0.14	0.19	0.19	0.16	0.15	0.15	0.13	0.13	0.21	0.18
Memphis	NW	0.37	0.35	0.39	0.32	0.26	0.18	0.27	0.24	0.23	0.26	0.38	0.29	0.39	0.39
Minneapolis	NW	0.10	0.11	0.10	0.17	0.13	0.13	0.33	0.26	0.25	0.21	0.42	0.34	0.44	0.41
Nashville	AA	0.15	0.21	0.19	0.22	0.17	0.15	0.08	0.14	0.14	0.25	0.31	0.16	0.02	0.07
Philadelphia	US	0.20	0.20	0.20	0.10	0.10	0.08	0.07	0.21	0.32	0.33	0.27	0.26	0.30	0.29
Pittsburgh	US	0.28	0.29	0.22	0.08	0.06	0.16	0.20	0.27	0.40	0.39	0.45	0.45	0.49	0.51
Salt Lake Cit	DL	0.14	0.09	0.09	0.14	0.24	0.15	0.21	0.21	0.19	-0.06	-0.04	-0.02	-0.19	-0.15
St. Louis	TW	0.12	0.12	0.10	0.18	0.10	0.06	0.06	0.03	-0.04	-0.04	0.01	-0.02	0.14	0.09
DC - Dulles	UA	0.01	0.17	0.17	0.17	0.12	0.11	0.15	0.16	0.16	0.17	0.21	0.20	0.32	0.37