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Are passengers willing to pay more for additional legroom?

Darin Lee^{a,*}, María José Luengo-Prado^b

^aLECG, LLC, 350 Massachusetts Avenue, Suite 300, Cambridge, MA 02139, USA

^bDepartment of Economics, Northeastern University, 301 Lake Hall, Boston, MA 02115-5000, USA

Abstract

This paper investigates whether or not the efforts by two of the largest US airlines to increase seat pitch (i.e. legroom) across their aircraft fleet during 2000 resulted in fare premia relative to the other 'full service carriers'. Using panel data from 1998 to 2002, we estimate fixed-effects regressions in markets with overlapping service between large hub and spoke carriers and find that United's 'Premium Economy' program was more successful than American's 'More Room Throughout Coach' program at generating fare premia.

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1. Introduction

The rapid expansion of low-cost carriers (LCCs) and recent bankruptcy filings by both United and US Airways has focused most of the recent attention regarding airline costs and service quality on the differences between the low cost (i.e., Southwest and JetBlue) and 'full service' (i.e., American and Delta) carriers.¹ In contrast, relatively little attention has been paid to the differences in service quality among carriers within either of these two groups. One area of service-quality competition that has received some recent attention is flight cancellations and delays (Mazzeo, 2003). Rather than explicitly attempting to link prices and service quality, this literature has focused primarily on the relationship between service quality and market concentration.² With regards to in-flight service quality,

the literature has typically assumed that full service carriers are, for the most part, fairly homogeneous. 57

In any given city or airport-pair market, there are number of factors that may account for differences in average fares across full service airlines. Numerous studies (Borensteijn, 1989; Evans and Kessides, 1993) have attempted to identify and assess the degree to which factors such as market share (both in the market and at the endpoint airports), network size, and the number of destinations served by a carrier from the endpoint airports impact a carrier's costs, potential market power and/or service quality—and hence its relative fares—in a given market. A unique change in relative service quality that occurred during 2000 among the 'full service' carriers in the US airline industry is examined. In particular, two of the largest US carriers—United and American—reconfigured their aircraft fleet to provide additional seat pitch (i.e., legroom) in their coach class cabins.³ By literally removing seats from 59
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*Corresponding author. Tel.: +1-617-761-0108; fax: +1-617-621-8018.

E-mail address: darin_lee@lecg.com (D. Lee).

¹See, for example, 'The Airlines' New Deal; Its Not Enough,' *Fortune*, April 28, 2003, and 'How to Fix the Airlines,' *BusinessWeek*, April 14, 2003.

²Rupp et al. (2003a, b) provide a closer link between pricing and delay/cancellation probability (their measure of service quality) in their examination of schedule recoveries following airport closures due to

(footnote continued) 77

security breaches following September 11th.

³TWA experimented briefly with expanded coach class seating in 1993 after it re-emerged from bankruptcy, but quickly discontinued its 'Comfort Class' after it failed to generate price premiums. Source: 'New Coach Seating Configurations—Comfort Class Deja Vu All Over Again?', *Plane Business*, February 12, 2000. 79
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83

1 their aircraft, these two carriers reduced the seating
 2 capacity of their aircraft, improving in-flight service
 3 quality, but at the same time, increasing unit operating
 4 costs. Therefore, an implicit assumption made by both
 5 American and United was that passengers would be
 6 willing to pay a premium for what was deemed to be a
 7 higher quality service offering. The purpose of this
 8 paper is to test the assumption that passengers are
 9 willing to pay more for one particular aspect of service
 10 quality—additional seat pitch.

13 2. Service-quality competition in the airline industry

15 Since the deregulation of the US airline industry in
 16 1978, service-quality competition, broadly defined, has
 17 evolved along two main lines: LCCs such as Southwest
 18 and JetBlue, and ‘full service’ carriers such as American,
 19 Delta, and United. LCCs primarily serve the most
 20 heavily traveled routes and are known for their simple,
 21 ‘no frills’ in-flight service and lower average fares
 22 (Morrison, 2001; Dresner et al., 1996). Full service
 23 carriers, on the other hand, differentiate themselves
 24 from LCCs by offering a number of service character-
 25 istics typically unavailable from LCCs such as extensive
 26 national and international route networks, pre-assigned
 27 seats, some degree of in-flight meal service on longer
 28 flights, multiple service/cabin classes, and comprehen-
 29 sive frequent flyer programs that permit passengers to
 30 earn and redeem miles on a wide range of domestic and
 31 international partners (both airline and non-airline).
 32 While most passengers can readily distinguish between
 33 the service quality of low cost versus full service carriers,
 34 many travelers would be hard-pressed to identify
 35 significant differences in service quality on comparable
 36 flights among the competing full service carriers. Thus,
 37 competition among the full service carriers in markets
 38 where their networks overlap has typically been in the
 39 form of price, flight frequency and schedule competition
 40 (Borenstein and Netz, 1999; Ross, 1997). Full service
 41 carriers have also attempted to differentiate themselves
 42 by comparing their on-time performance or even their
 43 amount of overhead luggage space. Carriers can also
 44 compete along less quantifiable service-quality dimen-
 45 sions such as crew friendliness.

47 During 2000, two of the largest full service carriers in
 48 the US, American and United, engaged in an overt (and
 49 heavily marketed) form of in-flight service-quality
 50 competition by reconfiguring their aircraft fleets to
 51 increase the ‘seat pitch’ in their coach class cabins. Seat
 52 pitch refers to the horizontal distance between the same
 53 part (i.e., front) of two seats in consecutive rows of an
 54 aircraft, and thus, greater seat pitch should be weakly
 55 preferred by passengers (all other things equal) to less
 seat pitch. Prior to these changes, each of the large
 network carriers offered industry standard seat pitches

of 31 to 32 inches. While American and United were the
 only two full service carriers to increase seat pitch in
 their coach class cabins, they adopted very different
 approaches.⁴ American’s program, referred to as ‘More
 Room Throughout Coach’ increased the seat pitch for
 all coach class seats across its entire aircraft fleet to
 between 33 and 35 inches. In contrast, United’s
 ‘Economy Plus’ class increased seat pitch to an
 industry-leading 36 inches, but the increased pitch was
 limited to the first 6–11 rows of the coach class cabin
 depending on aircraft type. Thus, while all coach class
 passengers on American experienced ‘More Room
 Throughout Coach’ starting in 2001, only a subset of
 coach class passengers (in general, high yielding business
 passengers) received extra legroom on United. In
 particular, United’s Economy Plus seats are typically
 reserved for their top tier frequent flyers or passengers
 purchasing full fare or only moderately discounted (Y, B
 or M class) coach tickets.⁵

While increased seat pitch—all things equal—would
 likely please most passengers, it is both costly and risky
 for an airline to provide given the competitive nature of
 the industry. Since increased seat pitch necessarily
 reduces the number of seats per flight and most
 operating costs remain constant regardless of the
 number of seats, a carrier that increases its seat pitch
 also increases its unit operating costs. (Fewer seats
 would also result in less weight, which in turn would
 reduce fuel costs, however, this impact is likely to be
 negligible.) These higher unit costs can potentially be
 overcome if passengers value extra seat pitch enough to
 pay a premium for it.⁶ There is no guarantee, however,
 that passengers—even if they are aware of the difference
 in seat pitch—are willing to pay a fare premium relative
 to other carriers for this added element of in-flight
 service quality.

93 3. Model and data

95 Our analytical approach is to estimate fixed-effects
 96 price equations using a cross section of airport-pair
 97 markets prior to and following the changes in seat pitch.
 98 Controlling for factors that are known to impact relative
 99 fares and assuming that no other changes in relative

103 ⁴JetBlue recently announced it too would increase seat pitch in
 104 roughly two-thirds of its seats to 34 inches. See ‘JetBlue Adds More
 105 Legroom Across Fleet,’ company press release, November 13, 2003.

106 ⁵Source: www.ual.com.

107 ⁶It is also possible that the higher unit costs could be overcome by
 108 increasing load factors. However, since both carriers’ programs
 109 reduced seating capacity at a time when load factors were high by
 110 historical standards (for example, American’s domestic load factor in
 111 2000 was 70.4% versus an average of 62.6% during 1990–1999), it is
 likely that the carriers’ primary goal was to attract higher paying
 passengers.

1 service quality occurred over the same period, compar- 57
 2 ing the difference between coefficients on carrier dummy 59
 3 variables prior to and following the changes should 61
 4 allow us to determine what impact—if any—the change 63
 5 in seat pitch had. 65

6 Since our goal is to identify the impact of changing 67
 7 one particular element of service quality, it is important 69
 8 that we control for other service quality factors as much 71
 9 as possible. We attempt to do this in two main ways. 73
 10 First, a data set is built using a sample of passengers 75
 11 purchasing as close substitutes as possible. Second, a 77
 12 number of independent variables are included that 79
 13 regarded to impact a carrier's relative service quality 81
 14 and hence, its relative fares in a particular airline 83
 15 market. 85

16 The data for the analysis are from the US Department 87
 17 of Transportation's OD1A database, a 10% sample of 89
 18 all domestic Origin and Destination (O&D) passengers 91
 19 traveling on US scheduled carriers. Only passengers 93
 20 traveling on the full service airlines, commonly referred 95
 21 to as the 'Big Six' carriers: American, United, Delta, 97
 22 Northwest, Continental, and US Airways, are consid- 99
 23 ered. Many studies of the airline industry (i.e. Brueckner 101
 24 and Whalen, 2000) have shown that passengers are 103
 25 typically willing to pay more for non-stop versus 105
 26 connecting service. Likewise, it has been well documen- 107
 27 ted (i.e. Morrison and Winston, 1995) that one-way 109
 28 tickets are priced higher than round-trip tickets and that 111
 29 fares on routes to and from hubs differ from those which
 30 neither originate nor terminate at a major carrier's hub.
 31 To control for any potential price premia associated
 32 with these factors, the data are restricted to passengers
 33 who, purchased a roundtrip coach class ticket, neither
 34 originated nor terminated at any of the 'Big Six' carriers'
 35 hub airports,⁷ and travelled on a one-stop itinerary.
 36 Moreover, to control for any price differences that may
 37 result from either cost or willingness to pay differences
 38 associated with 'mainline' versus regional/commuter
 39 aircraft, the data is further limited to include only those
 40 itineraries in which passengers flew exclusively on large
 41 jet (i.e. mainline) aircraft. Both American and United
 42 implemented changes in their seating configuration
 43 throughout 2000 and the data are constructed as a 5-
 44 year panel using annual data for the years 1998–2002.⁸

45 Annual rather than quarterly data to avoid fluctua-
 46 tions in the data caused by short-term labor disruptions

47 ⁷The hubs we include for each carrier are: American (DFW, ORD,
 48 MIA and STL), Continental (CLE, EWR and IAH), Delta (ATL,
 49 CVG and SLC), Northwest (DTW, MEM, MSP), United (DEN, IAD,
 50 ORD, and SFO) and US Airways (CLT, PHL and PIT).

51 ⁸While United's conversion of its Boeing 777 fleet is still ongoing,
 52 this aircraft is used primarily for international service. Moreover,
 53 to account for American's acquisition of TWA in 2001—and the
 54 subsequent conversion of TWA's fleet to include 'More Room
 55 Throughout Coach'—American's itineraries that connected via St.
 56 Louis are excluded.

or price wars. Based on this sub-sample of the raw data, 57
 a directional airport-pair markets is constructed that 59
 considers only those markets where either American or 61
 United and at least one other 'big six' carrier (i.e., Delta) 63
 each served 500 or more passengers during each of the 5 65
 years of our sample. Airport-pairs are used rather the 67
 city-pair markets to control for differences in will- 69
 ingness-to-pay based on different airports within a 71
 metropolitan area. Likewise, directional are used rather 73
 than non-directional markets to control for differences 75
 in marketing or frequent flyer loyalty at the different 77
 endpoints of a market. In the example above, we would 79
 require that Delta served the market in each of the 5 81
 years of our panel. Separate samples of markets for 83
 American and United are used to see if changes in their 85
 respective seat pitch impacted relative fares in markets 87
 where they had overlapping connecting service with 89
 other carriers. The American sample consists of 994 91
 unique markets and the United sample of 771 markets. 93
 Within the set, American has the most overlapping 95
 markets with Delta (712) and the fewest with US 97
 Airways (228). Similarly, United has the most over- 99
 lapping markets with American (542) and the fewest 101
 with US Airways (220). The combined revenues of the 103
 Big Six carriers for connecting passengers each year is 105
 between \$1.25 and \$2 billion. 107

108 Finally, during the period of time covered by our 109
 109 analysis—1998 to 2002—the use of Internet channels 111
 such as Orbitz, Expedia or Travelocity to instantly 113
 compare airfares across different carriers became a 115
 widespread phenomena. Consequently, the increased 117
 price transparency afforded by the emergence of 119
 Internet travel sites would lead one to expect any fare 121
 premia that existed at the beginning of our data set to 123
 diminish as time passed. 125

126 Fixed effects fare equations are estimated for both 127
 128 markets that allows us to control for unobservable 129
 129 effects correlated with the observed explanatory vari- 131
 130 ables, lessening possible omitted variable biases. The 133
 131 market fixed effects control for demand and cost 135
 132 differences that are common for all airlines serving the 137
 133 same market (such as distance, total market size or 139
 134 competition from LCCs) yet vary across markets. Note 141
 135 that this approach does not permit identifying the effects 143
 136 of variables that do not vary within a market. The 145
 137 equation is: 147

$$F_{ij} = X'_{ij}\beta + u_j + \varepsilon_{ij},$$

148 where F_{ij} is carrier i 's passenger-weighted average 149
 149 roundtrip fare (net of all taxes and fees) in dollars in 151
 150 market j , X_{ij} is a vector of regressors that varies with the 153
 151 airline's identity within a market and u_j are the market 155
 152 fixed effects. The random error ε_{ij} is assumed to be i.i.d. 157
 153 with zero mean and variance σ_{ε}^2 . The vector X includes 159
 154 independent variables that control for carrier identity 161

- and time, as well as other elements of service quality and/or potential market power:
- $share_{ij}$, (market share). The carrier's share (in percentage points) of all O&D passengers (connecting and non-stop) in market j . To deal with possible endogeneity in the determination of fares and market shares in a given airport-pair market, we instrument for $share_{ij}$ using the previous year's market share.
- $dist_{ij}$, (itinerary distance). The average distance (in hundreds of miles) traveled by passengers on carrier i in market j , passenger weighted by specific routing. We also include the squared distance. Longer distances resulting from more circuitous routings may be considered less desirable, lowering fares. On the other hand, more circuitous routings also cost more to provide, which could result in higher fares.
- $orgshare_{ij}$, (originating share). Carrier i 's share (in percentage points) of passengers across all markets at the originating airport in market j , among the Big Six carriers. Numerous researches (Evans and Kessides, 1993) have noted that high market shares at endpoint airports may provide carriers with a pricing advantage on markets served from that airport due to frequent flyer program loyalty or other marketing advantages.
- $frequency_{ij}$, (schedule frequency). Higher flight frequency in a market represents higher quality service for most passengers. We construct our schedule frequency variable in the following way. Travel between the origin and destination of market j on carrier i can involve routings over a number of potential hubs. The schedule frequency for each of these hub routings is computed as the minimum of the average daily flights from the origin to the hub and the average daily flights from the hub to the destination. For each market and carrier, $frequency_{ij}$ is then computed as the sum of these minimum daily routing values across all of the possible hubs for that carrier. There are two elements of scheduling that are not fully account for—the precise timing of flights throughout the day and elapsed travel time. Passengers may prefer flights that depart during one part of the day more than others. Likewise, routings with longer distances may still have shorter elapsed travel times.
- $business_{ij}$, (business passengers). Passenger mix can have a significant impact on average fares (i.e. Lee and Luengo-Prado, 2002). $business_{ij}$ is the proportion of carrier i 's passengers in market j purchasing tickets with fares of 60% or more of the market's 95th percentile fare. Business passengers are proxied using this method since the fare coding definitions in the DOT's OD1A database may not be comparable across carriers or may have changed over time.
- $nsdum_{ij}$, (non-stop dummy). If a carrier offers non-stop service in market j , it may impact its pricing strategies for its connecting service in this market. For example, a carrier may price its non-stop service less aggressively than it otherwise would if it also offered non-stop service in that market, for fear of cannibalizing its higher quality (i.e., non-stop) service. $nsdum_{ij}$ is a dummy variable that takes the value 1 if carrier i served market j with non-stop service and takes the value 0 otherwise.
- $ontime_i$, (ontime performance). Carriers with superior on-time performance may be able to charge higher prices on competitive routes if passengers are aware of such performance. On the other hand, higher on-time performance lowers costs, which in turn may be passed along to consumers in the form of lower fares. $ontime_i$ measures the percentage of carrier i 's system-wide flights that arrived on-time, as measured by the Department of Transportation's *Air Travel Consumer Reports*. We chose system-wide rather route specific on-time performance since on-time performance tends to be reported in the media on a system-wide, rather than route specific basis. Moreover passengers who experience poor on-time performance on a given carrier are likely to associate this element of service quality to the carrier as a whole, rather than the carrier on a specific route.
- $leverage_i$, (firm financial condition). Busse (2002) indicates that a carrier's financial condition may impact its proclivity to price more aggressively and to meet its debt payment obligations. To allow for this, the carrier's leverage ratio (defined as Total Assets/Total Stock Equity) as an indicator of its financial condition using data from the Department of Transportation's Form 41 database. Since US Airways' leverage becomes negative in 2002, the 2001 level is used.
- $trend$, (time trend). A time trend is used to reflect the steady decline in average airfares since 1990 (Lee, 2003).
- $D(carrier)_{pre}$ and $D(carrier)_{post}$ (carrier dummies). Since the primary interest is in determining the impact American and United's increased seat pitch programs had on their fares relative to other full service carriers, a number of carrier dummy variables are used. For each carrier, there are two dummies, one taking the value one (zero otherwise) if the year is prior to the change in seat pitch (1998, 1999 or 2000) and the other taking the value one (zero otherwise) if the year is after the change occurred (2001 and 2002).
- Although load factor is another possible candidate for an independent variable, average fares and load factors tend to be endogenous. Since there is no obvious instrument for load factor and it was found to be insignificant when included, it is exclude from the list of independent variables. Summary statistics are presented in Table 1.
- Fixed effects two-stage least squares using two model specifications are used for estimation. Model 1 pools all carriers—other than the base carrier of interest—while Model 2 uses carrier specific dummy variables (Table 2). The overall fits of the regressions are quite strong and the estimated coefficients tend to have the expected sign and are typically significant at the 1% or 5% level. The

Table 1
Summary statistics

Variable	American airlines Overlap markets		United airlines Overlap markets	
	Mean	Std. dev	Mean	Std. dev
<i>fare</i>	345.89	123.53	347.76	127.89
<i>share</i>	14.97	14.79	14.56	14.50
<i>dist</i>	19.92	6.97	20.32	6.68
<i>orgshare</i>	21.10	13.95	20.96	13.92
<i>frequency</i>	6.12	3.94	6.41	4.23
<i>business</i>	21.90	12.90	21.04	12.35
<i>nsdum</i>	0.10	0.30	0.12	0.32
<i>ontime</i>	77.88	4.83	77.18	5.44
<i>leverage</i>	4.46	2.11	4.73	2.28
<i>N</i>		16,760		13,275
Markets		994		771

estimated coefficients on *share*, *orgshare*, *frequency* and *business* are positive and significant at the 1% level in all four regressions, consistent with the previous literature. Likewise, the estimated coefficients on *leverage* and *trend* are negative when significant, consistent with our a priori beliefs.

The coefficient on *ontime* is negative, indicating that as a carrier’s on-time performance improves, all other things equal, the carrier’s average fares decline. This suggests that superior on-time performance does not provide a carrier with a pricing advantage. Rather, the negative estimated coefficient for *ontime* suggests that there may be cost savings that are being partially passed along to consumers when carriers experience relatively fewer delays. The estimated coefficient on *distance* is consistently positive and significant at the 1% level, indicating that all things equal, longer routings are relatively more expensive. This indicates that cost considerations prompt carriers to price circuitous routings higher than more direct routings.

Looking at the dummy variables, there is evidence that American’s ‘More Room Throughout Coach’ program failed to yield any price premia. To the contrary, Model 1 indicates that prior to implementing the program, American typically received a \$10.47 premium per ticket relative to all other carriers. After implementing ‘More Room Throughout Coach’ however, its overall premium relative to the other full service carriers fell to \$2.10, a net drop of \$8.37 per ticket. Likewise, relative to its own service before the change, American’s fares fell by \$16.88 after the change, all other things equal, as indicated by the estimated coefficient on $D(itself)_{post}$. Model 2 confirms that on a head-to-head basis with other carriers, American’s premium declined versus every carrier except US Airways. Prior to the change, for example, American had price premia versus Continental and Delta of \$25.70 and \$16.45, respectively. Following the change, American’s premium versus Continental was reduced to \$6.2

while its premium versus Delta became a small deficit(−\$2.06). American maintained a positive premium versus Northwest, but it declined from \$22.23 before the change to \$14.96 after the change. Finally, prior to the change, American already had a price deficit versus United of −\$17.13 and following the change, this deficit increased to −\$24.03 per ticket.

For United’s ‘Economy Plus’ program, Model 1 indicates that prior to the change, United generated a significant fare premium of \$24.95 per ticket versus the other full service carriers as a whole. Following the change, United’s fare premium expanded to \$36.33, an increase of \$11.38 per ticket. The positive and significant estimated coefficient on $D(itself)_{post}$ confirms that United’s Premium Economy program helped it boost its average fare, all other things equal. From Model 2, we see that United had fare premia versus all of its full service competitors (with the exception of American, which was not significant) prior to the change in seat pitch.⁹ Following the change, United, unlike American, maintained fare premia versus all five of its full service competitors. United’s fare premium increased following the change versus American and US Airways, declined modestly versus Northwest (\$24.62–\$23.74) and Delta (\$15.58–\$12.82), and fell more significantly (\$38.11–\$18.10 per ticket) versus Continental.

4. Conclusions

This is no evidence that passengers were willing to pay a premium for the extra legroom offered by American’s More Room Throughout Coach program. To the contrary, the evidence is that the program resulted in

⁹The estimated coefficient for $D(United)_{pre}$ in American Model 2 differs from the estimated coefficient on $D(American)_{pre}$ in United Model 2 because the data include different sets of markets where the airlines do not compete.

Table 2
Estimation results

	American		United	
	Model 1	Model 2	Model 1	Model 2
<i>share</i>	0.898** (0.076)	0.996** (0.076)	1.245** (0.089)	1.160** (0.090)
<i>business</i>	2.380** (0.048)	2.075** (0.048)	2.407** (0.056)	2.240** (0.056)
<i>distance</i>	6.856** (1.206)	7.599** (1.185)	8.295** (1.307)	7.093** (1.301)
<i>orgshare</i>	0.420** (0.044)	0.337** (0.046)	0.386** (0.051)	0.380** (0.052)
<i>frequency</i>	2.456** (0.198)	2.071** (0.195)	2.670** (0.208)	2.540** (0.207)
<i>nsdum</i>	4.148 (1.789)	4.743** (1.759)	2.224 (1.963)	1.766 (1.947)
<i>ontime</i>	-1.631** (0.135)	-0.283 (0.178)	-0.390** (0.138)	-1.368** (0.168)
<i>leverage</i>	-1.058** (0.274)	-0.05 (0.654)	-4.308** (0.324)	1.277 (0.659)
<i>trend</i>	-10.547** (0.733)	-8.069** (0.742)	-13.109** (1.086)	-16.885** (1.068)
<i>D(all others)_{pre}</i>	-10.468** (1.305)		-24.946** (1.906)	
<i>D(itself)_{post}</i>	-16.877** (2.754)		9.290** (3.055)	
<i>D(all others)_{post}</i>	-18.975** (2.448)		-27.039** (2.830)	
<i>D(American)_{pre}</i>		Dropped		1.863 (2.677)
<i>D(Continental)_{pre}</i>		-25.700** (2.126)		-38.109** (3.178)
<i>D(Delta)_{pre}</i>		-16.451** (1.765)		-15.579** (3.136)
<i>D(Northwest)_{pre}</i>		-22.229** (2.142)		-24.623** (2.925)
<i>D(United)_{pre}</i>		17.127** (2.362)		Dropped
<i>D(US Airways)_{pre}</i>		-27.453** (3.042)		-24.789** (3.262)
<i>D(American)_{post}</i>		-35.122** (2.944)		-3.266 (3.131)
<i>D(Continental)_{post}</i>		-35.737** (3.309)		-10.182** (3.799)
<i>D(Delta)_{post}</i>		-33.062** (2.961)		-4.901 (3.732)
<i>D(Northwest)_{post}</i>		-50.081** (3.120)		-15.818** (3.669)
<i>D(United)_{post}</i>		-11.092** (3.529)		7.916** (3.059)
<i>D US Airways)_{post}</i>		-84.114** (5.933)		-63.495** (4.342)
Observations	16,760	16,760	13,275	13,275
Number of markets	994	994	771	771
\bar{R}^2	0.7902	0.8008	0.7985	0.8024

*Significant at the 5% level; ** significant at the 1% level.

lower average fares for American. In contrast, United's Premium Economy program was effective in attracting passengers willing to pay higher fares for greater seat pitch when offered a choice of otherwise comparable

service among competing full service carriers. Thus, United's Economy Plus program would seem to have been more effective at generating or maintaining fare premia than American's More Room Throughout Coach program. Indeed, the relative success of United's program compared to American's sheds some insight as to why American recently announced it would discontinue its 'More Room Throughout Coach' program in roughly one-quarter of its fleet.¹⁰

That fact that United's increased seat pitch program aimed squarely at the 'business' traveler segment of the market appears to have performed better may be a reflection of the importance of business travelers to the full service carriers. Many leisure travelers are likely to choose the lowest-priced carrier, regardless of service quality. Business travelers on the other hand, tend to be less price-elastic, and since United's Economy Plus seats offer the greatest coach class seat pitch of the major carriers, those passengers who value the extra space the most may be willing to pay a fare premium for United's service. In this sense, the analysis provides empirical evidence to support models of spatial competition (Hotelling, 1929).

Nevertheless, the full impact of this aspect of service-quality competition will likely not be known for some time to come. For example, since many leisure passengers travel by air infrequently, it may take time for passengers to experience and learn about differences in the aspect of in-flight service quality we study in this note. Likewise, while the focus of our analysis has been on whether or not the increased seat pitch programs generated fare premia, it is important to note that the carriers themselves are likely to focus more heavily on the overall revenue impact. Thus, while 'More Room Throughout Coach' does not appear to generated fare premiums for American, it is possible that the revenue impact may have been positive if the higher quality service resulted in higher load factors. Finally, some of the differences in relative fares we find may have been caused by other changes in service quality during the period of our analysis that we have not been able to control for, such as perceived safety and crew friendliness.

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¹⁰See 'American Airlines Charts Course for Brighter Future: CEO Arpey Unveils 'Turnaround Plan' at Annual Meeting,' company press release, May 21, 2003.

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