TIME TO BUY: DETERMINING HOW AIRFARES VARY WITH PURCHASE DAY OF THE WEEK

A Thesis

by

LISA MARIE TAYLOR

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

December 2011

Major Subject: Economics

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Approved by:

Co-Chairs of Committee,	Steven Puller
	Steven Wiggins
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ABSTRACT

Time To Buy: Determining How Airfares Vary with Purchase Day of the Week.

(December 2011)

Lisa Marie Taylor, B.S., Kansas State University

Co-Chairs of Advisory Committee: Dr. Steven Puller
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In this paper, I empirically identify a new source of price discrimination utilized by airlines, namely, price discrimination based on the day of the week a ticket is purchased. Using unique transaction data, I compare tickets that are identical in every aspect except day of the week purchased (that is, traveling on the same date on the same route on the same airline with the same restrictions on flights with the same load factors and purchased the same number of days in advance), and find that airfares are cheapest when bought on the weekend. The size of this weekend purchase effect varies with distribution channel (online or offline) and how far in advance of departure the ticket is purchased. For transactions occurring more than two weeks before the departure date, offline weekend purchases are 3% cheaper than those made on weekdays, but online purchase prices do not differ significantly throughout the week. Conversely, in the final two weeks before departure, weekend purchases are 4% less expensive online but not significantly cheaper offline. These findings are consistent with price discrimination between high-elasticity leisure customers and low-elasticity business customers. If airlines believe that weekend purchasers are more likely to be price-elastic leisure

travelers, then they may offer lower prices or make deals more transparent on the weekend. This conjecture is supported by the finding that the weekend purchase effect is generally larger on routes with a mixture of both business and leisure customers than on routes primarily traveled by leisure customers because price discrimination is both possible and effective on these heterogeneous routes.

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1. INTRODUCTION

Airlines can use a variety of mechanisms to implement price discrimination. The existing theoretical and empirical literature has investigated several of the means that airlines use to segment customers by willingness to pay. Advance purchase restrictions can be utilized in segmenting consumers by their value of time (Gale and Holmes (1993)) and may be sold disproportionately to customers with low valuation (Dana (1998)). Tickets with Saturday night stay restrictions and other travel restrictions have been shown to have lower fares, suggesting that ticket restrictions are used to price discriminate (Stavins (2001); Puller, Sengupta, and Wiggins (2009)).

However, the existing literature has not investigated whether airlines segment customers by the time of purchase. Airlines have the ability to dynamically change prices daily using sophisticated computer reservation systems. If customers with differing price elasticities are more likely to purchase tickets on specific days of the week, then airlines may find it profitable to change fares based on the timing patterns of consumer purchases. I study whether airlines charge lower fares for the same tickets based on the day of week of purchase, and I then investigate whether this phenomenon is consistent with price discrimination.

Although the popular and trade press has speculated that fares are lower when bought on specific days of the week, there are various selection issues that could

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This thesis follows the style of Economic Letters.

confound the relationship between fares and day of week of purchase. One would need to control for a variety of ticket characteristics to accurately assess such claims. The usual data set employed in previous work on airline pricing is assembled from the U.S. Department of Transportation's Airline Origin and Destination Survey (DB1B) and does not include purchase or departure date nor ticket restrictions; thus, it is not adequate to properly control for other factors that could affect pricing. Likewise, data on posted airfares gathered via web-scraping are not sufficient to address this issue. Although many observations pertaining to a single flight can be collected over time, the restrictions and load factors associated with such fares are generally unobservable (or at least hard to obtain).

Therefore, I utilize detailed transaction data including restriction and characteristic information to determine if airfares on otherwise identical itineraries differ solely because they are purchased different days of the week. I find that after controlling for a large collection of ticket characteristics and restrictions, tickets purchased on Saturday and Sunday are cheapest, with prices up to 5% less expensive than on weekdays. This suggests that airlines discount tickets or make discounts more transparent on the weekend to encourage purchases by high-elasticity customers. Weekday purchases are likely to be for business purposes; thus, these customers have less incentive to purchase the cheapest tickets available. Customers buying on the weekend are more likely to be purchasing tickets for leisure travel and consequently are more price elastic.

When buying offline (through a brick-and-mortar travel agency or via telephone) more than 14 days before departure, weekend transactions are 3% less expensive than weekday transactions. Online purchase prices do not differ between weekdays and weekends in this same period, suggesting that weekday customers purchase low-priced tickets comparable to those available to weekend buyers. In the final two weeks leading up to departure, online purchases are 4% cheaper on the weekend while offline purchase prices do not vary significantly throughout the week. Additionally, I find that the weekend purchase effect is generally larger on routes frequented by both business and leisure travelers where price discrimination is practical and effective.

These results differ from those of Mantin and Koo (2010), who analyzed a collection of fares from Farecast.com and found that, for a given route, average price is not affected by purchase day of the week but price dispersion is higher Friday through Sunday. These dissimilarities most likely arise from fundamental differences in the data. Mantin and Koo utilize posted online fares, while this study uses transacted fares from both online and offline purchase channels. Also, this data set makes it possible to account for factors not controlled for by Mantin and Koo, including airline and ticket restrictions.

2. METHODOLOGY

The unconditional mean fare for weekday purchases (Monday through Friday) is $365.20, compared with $289.77 for tickets purchased on the weekend (Saturday and Sunday). Although the mean fare is lower for weekend purchases, one should consider many confounding variables affecting airfares before concluding that airlines price tickets differently according to purchase day of the week. Customers purchasing on weekends may be more likely to purchase tickets for off-peak travel times or tickets for more restricted travel. Below, I explore if lower unconditional fares for weekend purchases are driven by different types of tickets being purchased by these customers. I find that weekend transactions are less expensive even after accounting for a large set of potential selection effects.

The number of days in advance of departure the ticket is purchased has been shown to have a significant impact on price, with ticket prices increasing as departure nears. This price increase is most dramatic in the last 7-14 days before departure. [1] Those buying tickets further in advance may have higher price elasticities than those purchasing in the last few weeks before departure. Additionally, airlines may have incentives to charge higher prices on flights with higher demand (Gale and Holmes (1992, 1993)) or on flights with more demand uncertainty (Dana (1999)). This could confound a weekend purchase effect if tickets purchased on Saturday and Sunday are cheaper only because they are also purchased further in advance than those bought

[1] See Mantin and Koo (2010), Pels and Rietveld (2004), and Stavins (2001).

Monday through Friday or because they have higher or more uncertain demand. To address this concern, I include controls for purchase days in advance and three different metrics of load factor.[2] Expected and actual load factors are measures of anticipated and realized demand for a flight, and theory suggests that tickets for flights with higher load factors will be priced higher.[3]

Timing of the flight's departure and return as well as the length of stay of the itinerary are likely to be important determinants of airfare because travel during off-peak times is expected to be less expensive than travel during peak times (Gale and Holmes (1993)). Customers buying tickets on Saturday and Sunday may be more likely to choose departures during off-peak travel times, leading transacted ticket prices to be lower on the weekend. I account for the effects of these timing characteristics by controlling for the ticket's departure week of the year, day of the week, and time of day; return day of the week and time of day; and length of stay.

Airlines can use ticket restrictions to discriminate between business customers with low price elasticities and leisure customers with high price elasticities. With most restrictions, consumers face a trade-off between price and flexibility of travel plans. As

[2] It is important to note that a mechanical relationship exists between the purchase day of the week and the number of days in advance of departure a ticket is bought. For any given flight, purchase day of the week cannot vary randomly with purchase days in advance. That is, for the same flight, it is not possible to observe both a ticket purchased 23 days in advance on a Tuesday and another ticket purchased 23 days in advance on a Friday. This can pose a complication if there is a systematic relationship between fare and the number of days in advance (e.g., if airlines use booking curves). It turns out that the conditional mean of airfares (based on the preferred specification below) is highest for Thursday and Friday departures. Because price falls as the ticket is purchased further in advance, especially in the last week before departure, one would expect lower fares on tickets purchased (the previous) Friday or Saturday. To address this complication, I re-estimate the model using a period when the booking curve is relatively flat – more than 14 days before departure – and continue to find a weekend purchase effect.

[3] See Puller, Sengupta, and Wiggins (2009) for details on the calculation of load factor measures.

a result, one would expect airlines to offer lower fares on more restricted tickets that target customers who are more price elastic. Tickets with advance purchase requirements, travel restrictions, and stay restrictions are expected to be discounted while refundable tickets are expected to sell at a premium. An itinerary that includes a Saturday night stay-over is expected to be priced lower. Full coach or business class tickets are expected to be more expensive than their regular coach class counterparts. Lower weekend prices may simply reflect that those purchasing on the weekend are more willing to accept less desirable tickets (with more restrictions or lower class seating) or include a Saturday night stay-over in their travel plans. For example, the unconditional mean fare for tickets that are non-refundable with a travel or stay restriction (or both) is $184.20 less than the mean fare for refundable, unrestricted tickets. The data show that 62% of weekend purchases are for tickets with these restrictions while only 52% of weekday purchases are for same type of restricted tickets. This would lead to lower prices on the weekend if such restrictions are not controlled for. Hence, indicator variables for the various characteristics and restrictions are included as controls.

Finally, I allow for the distribution channel to affect fares directly and to affect the size of the weekend purchase effect. Sengupta and Wiggins (2006) showed that online ticket purchases are cheaper than comparable offline purchases. They argue that this phenomenon arises because online search costs are lower, enabling consumers to identify acceptable restrictions and thus purchase cheaper tickets. If tickets are more likely to be purchased online on the weekend, this may result in lower fares for tickets

bought on Saturday and Sunday. A dummy variable indicating whether the ticket was purchased online or offline is included to net out this effect. It is also possible that the difference between weekday and weekend transaction prices will vary with purchase channel. Thus, separate variables for offline weekend and online weekend purchases are added.

The resulting baseline model can be written as:

(1) $LogFare_i = \beta_0 + \beta_1 WeekendPurchase_i + \beta_2(AdvancePurchaseDays_i) + \beta_3(Timing_i) + \beta_4(Restrictions_i) + \beta_5(LoadFactors_i) + \beta_6 Online_i + \beta_7 Carrier\text{-}RouteFE_i + \varepsilon_i,$

where subscript *i* indicates an individual itinerary. The variables included in $AdvancePurchaseDays_i$, $Timing_i$, $Restrictions_i$, and $LoadFactors_i$ are described with the results of the model estimation.

3. DATA

The data were compiled from two major Computer Reservation Systems (CRSs) serving brick-and-mortar travel agencies, online travel agencies, and airline websites. I use data for every transaction occurring through a major CRS for travel in the last quarter of 2004. Each observation is for an itinerary on one of six major airlines (American, Delta, United, Continental, USAir, and Northwest) purchased no earlier than June 2004. Each of these airlines served at least 5% of U.S. domestic travelers; the only other carrier of this size is Southwest, which is excluded because of data limitations. For each itinerary, data describing the fare, airline, fare code, origin, destination, flight numbers, date of purchase, date and times of departure, date and times of return, booking class, and purchase channel (online or offline) were obtained from the first CRS. These observations were matched with further ticket-level information from another CRS. Characteristics and restrictions taken from this second CRS include fare, carrier, origin, destination, date of departure, date of purchase, booking class (coach or first class), refundability, advance purchase requirements, travel restrictions, and stay restrictions. Travel restrictions most often limited travel to specific days of the week (Tuesday through Thursday), while stay restrictions involved a minimum or maximum stay requirement.

I exclude itineraries including international travel, open jaws, circular trips, interlining, zero fare, or first class seating. Each ticket is for a direct flight with one coupon in each direction. The fares analyzed are for round-trip itineraries; one-way

ticket purchases were dropped from the analysis.[4] To avoid unusual travel periods, tickets for flights during Thanksgiving weekend (Wednesday through Monday), Christmas and New Year's (after December 22) are excluded. A total of 85 routes are analyzed, of which a majority include at least one hub airport for an airline in the sample.[5] These routes represent the largest routes for the included carriers with a variety of market structures. Thirty-six percent of the observations from the first CRS were successfully matched with the second CRS, resulting in a data set containing 145,425 observations.[6]

Two different measures are used to classify routes as either leisure or mixed. The first measure is a tourism index similar to that utilized by Borenstein and Rose (1994) and Gerardi and Shapiro (2009). The tourism index is equal to the ratio of 2004 accommodations income to total personal income for the Metropolitan Area of the destination airport (from the Bureau of Economic Analysis). Those routes with a tourism index in the 80th percentile and above are labeled "leisure" routes (this amounts to routes with destinations of Las Vegas, Nevada; Orlando, Florida; New Orleans, Louisiana; Miami, Florida; and Fort Lauderdale, Florida); the remaining routes are labeled "mixed."[7]

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[4] Results are largely unchanged qualitatively (and similar quantitatively) when including one-way ticket purchases with one-way fares doubled to obtain analogous round-trip fares.

[5] See Puller, Sengupta, and Wiggins (2009) for a list of routes.

[6] Matching was based on route, carrier, departure date, fare within 2%, and satisfaction of restrictions. For a detailed description of the matching process, see Puller, Sengupta, and Wiggins (2009).

[7] One route (DEN-ONT, with 94 observations) is excluded because of data limitations.

The second measure is based on data taken from the 1995 American Travel Survey conducted by the Bureau of Transportation Statistics. This survey lists the mode of transportation, origin, destination, and reason for travel (among other information) for over 550,000 individual trips. After restricting the data to commercial, regularly-scheduled flights, the share of trips taken for leisure purposes was calculated for each route.[8] Routes with a share of leisure trips of at least 80% are classified as leisure routes, while the remaining routes are categorized as mixed.[9] Table 1 lists summary statistics for variables utilized in subsequent analysis.

Table 1
Summary Statistics

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Round-trip fare	145425	361.722	268.7	62.48	3923.18
Weekend purchase	145425	0.046	0.210	0	1
American Airlines	145425	0.279	0.449	0	1
Delta	145425	0.152	0.359	0	1
United	145425	0.149	0.356	0	1
Continental	145425	0.203	0.402	0	1
Northwest	145425	0.097	0.296	0	1
USAir	145425	0.119	0.324	0	1
Number of days in advance of departure purchased	145425	18.545	21.401	0	192
Sunday departure	145425	0.113	0.316	0	1
Monday departure	145425	0.224	0.417	0	1

[8] The 1995 American Travel Survey lists 12 possible reasons for travel. A trip is classified as mixed if the reason given was business; combined business and pleasure; or convention, conference, or seminar. A trip is classified as leisure if the reason given was school-related activity; visiting friends or relatives; rest or relaxation; sightseeing or visiting a historic or scenic attraction; outdoor recreation; entertainment; shopping; or personal, family, or medical.

[9] Four routes (BOS-CLT, LAX-TPA, MCO-MSP, and MCO-PHL, with 1537 observations total) are excluded because data for these routes is not available in the 1995 American Travel Survey.

Table 1 Continued.

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Tuesday departure	145425	0.179	0.384	0	1
Wednesday departure	145425	0.167	0.373	0	1
Thursday departure	145425	0.143	0.350	0	1
Friday departure	145425	0.120	0.325	0	1
Saturday departure	145425	0.055	0.227	0	1
Sunday return	145425	0.127	0.333	0	1
Monday return	145425	0.106	0.307	0	1
Tuesday return	145425	0.139	0.345	0	1
Wednesday return	145425	0.162	0.368	0	1
Thursday return	145425	0.194	0.396	0	1
Friday return	145425	0.207	0.405	0	1
Saturday return	145425	0.065	0.247	0	1
Length of stay (days)	145425	2.686	2.735	0	79
1 day advance purchase requirement	145425	0.013	0.111	0	1
3 day advance purchase requirement	145425	0.081	0.273	0	1
5 day advance purchase requirement	145425	0.0005	0.021	0	1
7 day advance purchase requirement	145425	0.212	0.409	0	1
10 day advance purchase requirement	145425	0.025	0.157	0	1
14 day advance purchase requirement	145425	0.310	0.463	0	1
21 day advance purchase requirement	145425	0.020	0.141	0	1
30 day advance purchase requirement	145425	0.004	0.066	0	1
Refundable	145425	0.176	0.381	0	1
Travel restriction	145425	0.0447	0.497	0	1
Stay restriction	145425	0.308	0.462	0	1
Saturday stay included	145425	0.285	0.452	0	1
Booking class (1 if business or full coach, 0 if regular coach)	145425	0.118	0.322	0	1
Online	145425	0.123	0.328	0	1
Tourism index of destination	145331	0.019	0.037	0.003	0.129
Leisure route, based on tourism index	145331	0.195	0.396	0	1
Route share of leisure travel	143888	0.494	0.243	0	1
Leisure route, based on route share of leisure travel	143888	0.115	0.319	0	1

4. RESULTS

Table 2 presents coefficient estimates from the regression analyses in which I progressively control for more confounding factors. Controlling for only carrier-route fixed effects, weekend purchases are 12% cheaper than purchases made on weekdays (column (1)).[10] Adding purchase days in advance as control variables reduces the size of the weekend purchase effect so that weekend transactions are only 10% less expensive than weekday transactions (column (2)). I do not report all coefficients in Table 2, but I find that fares increase for purchases made closer to departure, especially in the last two weeks before departure. The inclusion of timing characteristics further reduces the size of the weekend purchase effect to 7% (column (3)).

The various ticket restrictions and characteristics that airlines can employ in price discrimination have an additional selection effect on ticket prices. Weekend purchases continue to be less expensive than weekday purchases, but the difference has fallen to 5% (column (4)). The effects of the restrictions and characteristics are mostly significant, with signs and magnitudes as predicted and largely consistent with existing work using these data (e.g., Sengupta and Wiggins (2006); Puller, Sengupta, and Wiggins (2009)). Advance purchase requirements lower ticket prices between 12% and 48%. Refundable tickets are 27% more expensive than non-refundable tickets. Tickets with a travel restriction are discounted 23% and those with a stay restriction are

[10] The following regression analyses were also performed letting price vary with individual purchase days of the week (instead of combining Monday through Friday as weekdays and Saturday and Sunday as weekend). The individual day discounts are within +/- 4% of the combined estimates, and the cheapest days most often occur on Sunday or Saturday and Sunday.

Table 2
Regression Results

Dependent variable: log(fare)

						Purchase Channel		
	Carrier-Route Fixed Effects Only	Advance Purchase Days	Timing Characteristics	Restrictions and Characteristics	Load Factors	All Tickets	Purchased More than 14 Days Before Departure	Purchased in Final 14 Days Before Departure
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Weekend purchase	-0.12*	-0.10*	-0.07*	-0.05*	-0.05*			
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)			
Offline weekend purchase						-0.03*	-0.03*	-0.02
						(0.01)	(0.01)	(0.01)
Online weekend purchase						-0.01	0.01	-0.04*
						(0.01)	(0.01)	(0.01)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Carrier-route fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of days in advance purchased	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Departure week of year, day of week, and hour of day; return day of week and hour of day; length of stay	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Advance purchase requirements, refundability, travel restriction, stay restriction, Saturday night stay-over, booking class	No	No	No	Yes	Yes	Yes	Yes	Yes
Actual load factor at departure and on day before purchase, expected load factor	No	No	No	No	Yes	Yes	Yes	Yes
Online purchase	No	No	No	No	No	Yes	Yes	Yes
Observations	145425	145425	145425	145425	145425	145425	66201	79224
Adjusted R-squared	0.3903	0.5515	0.5796	0.7215	0.7241	0.7280	0.6805	0.7460

+ significant at the 5% level, * significant at the 1% level

Standard errors are given in parentheses.

Estimated using ordinary least squares with robust standard errors, clustered by departure date.

discounted 7%. Inclusion of a Saturday night stay-over in the itinerary reduces price 14%. Full coach or business class tickets are 25% more expensive than regular coach class tickets.

Although load factors have a significant impact on price, their inclusion in the model does not change the size of the weekend purchase effect: weekend purchases remain 5% cheaper than weekday purchases (column (5)). When the effects of purchasing online versus offline are accounted for, I find that weekend purchases made offline are 3% cheaper than weekday purchases made via the same channel while online purchases are not priced significantly different on weekdays and weekends (column (6)).[11]

Because ticket price increases are greatest in the final two weeks before departure, it is worthwhile to divide transactions into those occurring more than 14 days in advance of departure and those occurring in the final 14 days leading up to departure. Differences in the weekend purchase effect for online and offline purchases arise between the two samples. For tickets purchased prior to the last two weeks before departure, I again find that offline purchases are 3% less expensive on the weekend while online purchase prices do not vary significantly throughout the week (column (7)). However, for tickets purchased in the final 14 days leading up to departure, weekend purchases are 4% less expensive online but not significantly cheaper offline (column (8)).

[11] I find that online purchases are 11% less expensive than offline purchases on weekdays, consistent with the results of Sengupta and Wiggins (2006).

One explanation for these findings is that airlines may price the same routes lower on weekend when more elastic customers make their purchases. As mentioned above, there is evidence that tickets targeting more elastic customers are purchased disproportionately more often on weekends. Also, a higher share of purchases are made online on the weekend than on weekdays because some offline purchase channels, such as brick-and-mortar travel agencies, are closed. During the week, many consumers are purchasing flights for business purposes and have less incentive to find the cheapest flights available. However, on the weekend, shoppers may be more likely to purchase leisure flights and thus be more price elastic. Therefore, airlines offer discounted fares or make the discounts that are available the rest of the week more transparent on weekends in an effort to target customers with more elastic demand.[12] Because the weekend purchase effect is not significant for all transactions, it is possible that some customers (e.g., online customers more than two weeks before departure and offline customers in the final 14 days leading up to departure) are purchasing tickets on weekdays at fares that are similar to those chosen by weekend buyers. The difference in the online and offline weekend purchase effect can potentially be attributed to differences in price elasticities and shopping behaviors. Future research could focus on explaining this difference if explicit data describing both the purchase channel and the reason for travel for each transaction becomes available.

To further investigate if these results are consistent with price discrimination based upon the price elasticities of consumers, I isolate routes that have a higher share of

[12] These lower prices must be made available through both online and offline purchase channels.

leisure travelers. It is likely that there is primarily one type of customer traveling on these "leisure" routes, and thus airlines have no incentive to price differently on weekends versus weekdays. However, "mixed" routes are more likely to have customers with higher elasticities buying on weekends than on weekdays, which creates an incentive for airlines to lower prices on weekends. Therefore, I expect the weekend purchase effect to be larger on mixed routes.

Table 3
Regression Results for Leisure versus Mixed Routes, Based on Tourism Index

Dependent variable: log(fare)

	Purchase Channel			
	Purchased More than 14 Days Before Departure		Purchased in Final 14 Days Before Departure	
	Leisure (1)	Mixed (2)	Leisure (3)	Mixed (4)
Offline weekend purchase	-0.02+	-0.04*	0	-0.02+
	(0.01)	(0.01)	(0.01)	(0.01)
Online weekend purchase	0.01	0	-0.02	-0.05*
	(0.01)	(0.01)	(0.02)	(0.01)
Observations	23881	42268	12232	66950
Adjusted R-squared	0.6350	0.7151	0.7058	0.7651

+ significant at the 5% level, * significant at the 1% level

Standard errors are given in parentheses.

Estimated using ordinary least squares with robust standard errors, clustered by departure date. All specifications include controls for number of days in advance purchased; departure week of year, day of week, and time of day; return day of week and time of day; length of stay; advance purchase requirements; refundability; travel restriction; stay restriction; Saturday night stay-over; actual load factor at departure and on day before purchase; expected load factor; online purchase; and a constant.

The results of separate regression analyses for leisure and mixed routes based on the tourism index are shown in Table 3. For transactions occurring more than two weeks before departure, the offline weekend purchase effect is significant on both types of routes but larger on mixed routes. Online purchase prices are not significantly different

throughout the week on either type of route in this same period (columns (1) and (2)). In the last 14 days before departure, the weekend purchase effect is significant both online and offline on mixed routes but not on leisure routes (columns (3) and (4)).

Table 4
Regression Results for Leisure versus Mixed Routes, Based on Share of Leisure Travel

Dependent variable: log(fare)

	Purchase Channel			
	Purchased More than 14 Days Before Departure		Purchased in Final 14 Days Before Departure	
	Leisure (1)	Mixed (2)	Leisure (3)	Mixed (4)
Offline weekend purchase	0	-0.03*	0	-0.01
	(0.01)	(0.01)	(0.02)	(0.01)
Online weekend purchase	0	0.01	-0.02	-0.05*
	(0.01)	(0.01)	(0.02)	(0.01)
Observations	9361	56105	7243	71179
Adjusted R-squared	0.6781	0.6887	0.7395	0.7453

+ significant at the 5% level, * significant at the 1% level
Standard errors are given in parentheses.
Estimated using ordinary least squares with robust standard errors, clustered by departure date. All specifications include controls for number of days in advance purchased; departure week of year, day of week, and time of day; return day of week and time of day; length of stay; advance purchase requirements; refundability; travel restriction; stay restriction; Saturday night stay-over; actual load factor at departure and on day before purchase; expected load factor; online purchase; and a constant.

Table 4 repeats the analyses using the alternative classification of leisure routes based on the 1995 American Travel Survey. The weekend purchase effect is statistically significant only for offline purchases on mixed routes made more than 14 days in advance of departure and for online purchases on mixed routes occurring in the last two weeks before departure (columns (1) through (4)). Thus, Tables 3 and 4 provide modest evidence consistent with a model in which airlines attempt to price discriminate between low-elasticity business customers and high-elasticity leisure customers.

5. CONCLUSIONS

The findings of this research robustly establish the existence of a weekend purchase effect on airline ticket prices. This effect can be as large as 5% and varies with the distribution channel and how far in advance of departure the ticket is booked. I find that the weekend purchase effect exists offline at 3% for tickets purchased more than 14 days prior to departure and online at 4% for purchases made in the final two weeks before departure. Furthermore, the weekend purchase effect tends to be greater on routes with a mixture of both leisure and business customers than on routes traveled primarily for leisure purposes. Because it is likely that a majority of weekday purchases are for business travel while most weekend purchases are for leisure trips, airlines target price elastic consumers by lowering prices or making discounts more transparent on the weekend. Thus, airlines may use the day of the week of purchase as an additional, previously unidentified mechanism to implement price discrimination.

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