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AIRLINE COMPETITION BETWEEN MEXICO AND THE UNITED STATES

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Abstract

This work analyses the effect of several publicly available variables in the pricing decisions of airlines, in routes between Mexico and the United States. This work contributes to the literature by analyzing pricing decisions not at a domestic market level, as it's more common, but at an international market level. This is the first study of its kind made completely with publicly available data. A database of 6676 prices was built, with prices from the 15 carriers transporting passengers between Mexico and the United States at the moment of the study. More than 480 routes were considered, totaling 1669 carrier-route combinations. Several econometric specifications are estimated, including a structural regression model and fixed effects models. Results show that there is a negative relationship between the number of carriers in the route and the price per kilometer in that route, even after controlling for the presence of low cost carriers in the route. There is some evidence that airlines charge an overprice for flights departing from Mexico City's international airport, possibly due to the airport's saturation conditions. Another result is that low cost carriers do not discipline non low cost carriers in a route, as non low cost carreirs do not respond to a route being operated by a low cost carrier; however, they do respond to the number of carriers in the route by reducing their price per kilometer.

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1 Introduction

According to the mexican SCT (Secretariat of Communications and Transportation, by its acronym in spanish), the air transportation market for passengers between Mexico and the United States has grown considerably during the last 15 years. Just the flow of passengers increased 163% from 1991 to 2014 (SCT, 2014).

Nevertheless, this figure may not represent the real growth potential of this market. There exists a limit in the number of airlines from each country that can operate any given route between the two countries[1]. At the end of 2015, the mexican and american governments signed an aviation agreement, in which the limit to the number of airlines operating each route would disappear, among other changes to the previous agreement[2]. Although it is not the intention of this work to analyze the possible effects of the new agreement, it is relevant in this context to determine which factors affect the competition dynamics in the Mexico-USA airline market.

This work analyzes the effect of competition-related variables on the price per kilometer of flights carrying passengers between Mexico and the United States. As Barnes (2012) notes, the air transport industry has experienced a trend in which consumers (especially leisure travelers) choose an airline based on the price it charges. Given the industry's low margins, it has become increasingly important for carriers to focus on what Barnes calls Pricing and Revenue Management (PRM) to increase profitabiliy and gain a competitive advantage. This has led to complex pricing schemes, depending on the type of customer, the flight time, time of booking, trip duration, competition, etc. Airlines' fares, therefore, serve as a good indicator of the dynamics of competition in the industry.

Much research has been devoted to analyzing competition in the airline industry from different perspectives. In terms of airport-airline competition, Starkie (2002) makes the case for regulation in the airline industry at the airport level. He argues that the argument of the airport industry as a natural monopoly is no longer sustainable, and that the degree of market power in an airport will depend on the closeness and substitutability of surrounding airports. Nevertheless, market power might not be necessarily exploited, to the extent airports combine runway and retailing activities. Oum, Zhang and Zhang (1996) investigate optimal airport pricing in a hub and spoke network, showing that it is possible to increase social welfare if instead of

1 Only two airlines from each country can operate a given route. For some touristic destinations the limit is three airlines per country.

2 The agreement had originally been announced in 2014, but it was until December 2015 that it was signed. For more information, see "Acuerdo sobre transporte aéreo entre el gobierno de los Estados Unidos de América y el gobierno de los Estados Unidos Mexicanos", available at http://www.sct.gob.mx/fileadmin/DireccionesGrales/DGAC/Alianza%20Por%20el%20Gobierno%20Abierto/US-Mexico_ATA_FINAL_Spanish_102115.pdf or "ABC del Acuerdo Bilateral de Servicios Aéreos de México con los Estados Unidos de América", available at http://www.sct.gob.mx/fileadmin/DireccionesGrales/DGAC/Platillas_2015_aviacion/Convenio-Bilateral/abc-acuerdo-bilateral.pdf.

pricing each airport in the network independently all the airports in the hub and spoke network are priced jointly. D'Alfonso and Nastasi (2012) analyze, from a game theoretical perspective, the effect of different types of agreements with vertical contracts between airports and airlines on prices, the quantity of flights and social welfare. They consider the case of an infinite linear city with potential consumers uniformly distributed along the city. There are two airports and in each airport there is a leading carrier and *N-1* followers. They find that, as expected, an increase in the number of followers reduces prices and increases quantity of flights offered, thus increasing social welfare. But they also find that there are incentives for collusion between airports and their leader carriers, driving followers out of the market, in equilibrium.

This latter result is at odds with what the model in Barbot (2009) predicts. Barbot presents two models with two pairs of airport-airline combinations. In one model these pairs share the same market and each pair has the same quality. In the second model there is vertical differentiation among the pairs and one of them has a larger market. Firms compete á la Bertrand in a three stage game. In the first stage they decide wether to collude or not. In the second stage, airports set their prices and in the last stage airlines compete. She finds that when firms are symmetrical and compete in the same market, there are no incentives for collusion between airports and airlines. When there is vertical differentiation, agreements may happen if marginal costs are substantially different. Collusion between airports and airlines ends up being a stable solution under market asymmetry.

Borenstein (1989) intends to quantify the exercise of market power in the airline industry by looking at the carriers' airport and route share of passengers transported. His results show that dominant airlines (those with the highest share of passengers enplanements or originating passengers at the airports) charge higher prices per mile, compared to non dominant airlines, in flights coming from or going to the dominated airports. Nevertheless, there is no evidence of spillover effects, that is, non dominant airlines are not able to charge significantly higher prices in the airports or routes in which they compete against the dominant carrier. In the subject of airport congestion, Brueckner (2002) departs from the vision that peak usage of a congested facility is excessive because users don't take into account the delays they impose on other users. Brueckner argues that this result was due to the fact that airlines were seen as atomistic users, as in road congestion analysis. Nonetheless, he points out, this is an incorrect view of airlines, due to the dominating presence they can have in an airport. In his model, each airline internalizes the congestion that each flight provokes on its other flights. He interprets this internalization as a sign that overallocation of flights on peak hours might not be as severe as the atomistic model would predict. In fact, when an airport is operated by a single carrier, the allocation of flights can be efficient.

Work in the subject of the effects of direct and potential competition on fares has also been made. For example, Kwoka and Shumilkina (2010) explore the effect on prices of eliminating a potential competitor. They study the merger of US Airways -USAir back then- and Piedmont Airlines in 1987. Using data on prices before and after the merger from the United States Department of Transportation (DOT), they find that prices increased between 5% and 6% on routes where the merger eliminated a potential competitor, that is, routes operated by USAir or Piedmont and in which the other member of the merger operated one or both endpoint cities of the route. Also, they find that, in routes where the merger eliminated an actual competitor, prices went up between 9% and 10.2%.

Goolsbee and Syverson (2008) examine how the threat of entry of Southwest Airlines influences prices of already established carriers. Looking only at the routes between airports in which Southwest operates, they define *threat of entry* as situations in which Southwest begins or announces it will begin operations in the second endpoint airport of a route. They find that incumbents reduce their price even before Southwest begins operations. Price reductions range from 6.5% six quarters before the date Southwest announced entry to up to a 24% price reduction on routes where Southwest threatens but does not enter for at least three quarters. Goolsbee and Syverson interpret this as a sign of incumbents taking preemptive action in order to deter Southwest's entry.

Meanwhile, Barbot (2007) investigates low cost carrier's behaviour regarding entry deterrence and accomodation. She develops two games, one with horizontal differentiation and the other with vertical differentiation. In the first game, the entrant may incur in a price war with the incumbent, while in the second game the incumbent tries to deter or accommodate entry with product proliferation. There are two airlines and two possible airports where to locate, with consumers uniformly distributed along a circumference of perimeter 1. She finds that, in the horizontal differentiation game, the entrant low cost carrier has incentives to establish a reputation as a predatory firm, but in the vertical differentiation case, the incumbent will only deter entrance if increasing its quality is not very costly. Barbot also presents some evidence of low cost carriers engaging in preemptive action, such as Ryanair opening two new routes connecting with Shannon, Ireland in response to Easyjet entering the London-Shannon route. Easyjet ended up discontinuing its service in the route, while Ryanair kept two of its three routes operating.

The work presented here is very similar to that of Ros (2011). In his article, Ros looks at the effect of several variables on the price per kilometer of mexican carriers in routes within Mexico. Among the variables he looks at are the route's distance, number of competitors in the route, airport use cost, an indicator variable for low cost carriers in the route, etc. He finds that Mexicana reduced its prices approximately 17% in routes in which it competed against a low cost carrier, but its prices per kilometer were not affected in routes in which it competed against the other incumbent carrier at the time, Aeroméxico. On the other side, Aeroméxico's prices were lower in routes in which it competed against Mexicana, but the presence of a low cost carrier in the route did not seem to affect its price per kilometer. Ros also finds that prices per kilometer of flights coming from or going to Mexico City were significantly higher. He attributes this result to Mexico City's airport saturation condition. Moreover, his results show a negative relationship between the route's endpoint cities population and the price per kilometer, as well as a negative impact on the price per kilometer of the presence of a low cost carrier in a route.

Borenstein and Rose (1994), analyze price dispersion in the US airline industry. Given that most of the airline passengers receive a discount off the coach fare, and that the modal fare on a route accounts for less than 30% of the ticket sales, they build a Gini coefficient of fares paid, reflecting the fare inequality across the entire range of fares paid, according to them. They find that the expected absolute fare difference between two passengers on the same airline is highly variable, from 3.6% of the average fare on one carrier-route combination in one sample to 83% in another sample. They also observe that, on routes with more than one carrier, the difference in average prices between carriers is smaller than the average difference in prices paid by two customers in the same airline. Among the determinants of price dispersion, they find that increasing the number of competitors, with the number of flights held constant, increases price dispersion. Greater flight frequency on a route diminishes this dispersion and carriers with airport dominance increase the dispersion of their fares in the routes they serve from the dominated airports. Touristic routes showed less price dispersion, while airlines with a computer reservation system have a higher dispersion than those without it[3].

Airlines' network structure and competition has been a recurrent theme in the literature as well. Pels (2009) explores the effects of the 2008 Joint Open Aviation Area between the United States and the European Union. According to him, once the deregulation of the Atlantic market takes place, airlines competing using hub and spoke networks will stick to their hubs and engage in alliance agreements with other airlines. In his analysis, if authorities intervene forbidding cooperation, airlines will not engage in alliances and will stick to their original network. Low cost carriers, who follow a strategy of servicing only the most profitable markets, will continue with this strategy in the Open Atlantic Aviation Area[4]. In Pels (2008), he explores the possible implications for airline networks of what he calls the "low cost revolution". Airlines

3 This matches well with Verlinda and Lane's (2004) discovery that internet usage increases the spread between fares, either restricted or unrestricted.

4 Balfour (2014) notes that, in the European Union, even after a weak start, liberalisation has been a success, with the emergence and preponderance of low cost carriers, a higher number of routes and lower fares. He also highlights the importance of regulation as a complement to liberalisation. Nevertheless, Mendes de León (2014), in his assessment of international airline competition, warns that "bilateral provisions may stand in the way of enforcing competition rules" and that "the market is governed by bilateral air services agreements limiting competition between the designated airlines under those agreements".

that use hub and spoke networks do not have an incentive to invade local markets of other hub and spoke carriers, due to the risk of retaliation[5]. On the other side, low cost carriers use "point to point" networks, which allows them to enter any market they want, making them the main competitors in short-haul routes. This doesn't mean that conventional, hub and spoke airlines do not compete in the short-haul routes, as they offer restricted low price tickets in these, using them as feeders for their intercontinental markets. Graham (2009) asks whether low cost carriers's financial success is due to the application of a single model of spatial network optimization or through the development of unique spatial structures. Using data on 6 low cost carriers, he finds that each carrier has a different network structure, from which he concludes that the network formed by the carrier depends also on the cultural, economic and political environments in which it operates. He finds that none of the carriers operates point to point networks with total connectivity, which is surprising since low cost carriers are often referred to as point to point carriers.

For this study, flight prices were taken for more than a month from the airlines' websites. A prices database was built, containing 6676 observations. Prices were taken for all the passenger transporting airlines operating routes between Mexico and the United States, considering 484 routes (Table 13 in the Appendix shows descriptive statistics for each of the 484 routes in the sample) and totaling 1669 carrier-route combinations. Each price was observed four times. Results show that there is a negative relatioship between the price per kilometer in a route and the number of competitors in that route, even after controlling for the presence of a low cost carrier. There also is evidence of a negative impact in the price per kilometer of the number of airlines operating either the route's origin or destination city. These findings match well with previous studies, as there is evidence that carriers respond not only to actual competition but also to potential competition by decreasing prices. It is as well found that airlines charge an overprice in flights departing from Mexico City and that non low cost carriers are not disciplined by low cost carriers in a route, but they do respond to the number of carriers in the route. The main results are robust to several specifications.

This work contributes to the literature analyzing the pricing decisions of carriers in an international market, not at the domestic level, as it is more common. To the best of my knowledge, this is the first study of airline competition across international borders made entirely with publicly available data. Moreover, the study focus on competition inside the american continent, whereas a good amount of the literature focuses on competition within Europe and between Europe and the US. The document is structured as follows: Section 2 contains the data description and some summary statistics; in section 3 the econometric specification(s) is defined; section 4 presents the results and section 5 concludes.

5 Fageda, Jiménez and Perdiguero (2011), looking at the other side of the coin, analyze when the spanish Iberia created Clickair to compete in the spanish low cost carrier market.

2 Data and Summary Statistics

Table 1 presents the variables utilized in this study and the sources from where they were obtained.

Table 1: Data Sources

Variable	Source
Flight's Prices and characteristics	Carriers' websites
Carriers' Hub cities	Carriers' websites
Direct flight distance (airport to airport)	USDOT, www.world-airport-codes.com
2010 Origin and destination population	SNIM, US Census Bureau
Origin and destination per capita GDP	SNIM, US Bureau of Economic Analysis

Distance between airports (in miles) was obtained from the US Department of Transportation[6]. This variable was transformed to kilometers using a conversion rate of 1.609 kilometers per mile. Since only 465 of the 484 routes used in this study appeared in the USDOT database, the missing routes' distances were taken from the website www.world-airport-codes.com[7]. Population in 2010 and GDP per capita in dollars were also obtained for each city in the sample. For mexican cities, this information was taken from the National System of Municipal Information (SNIM, in spanish). GDP figures correspond to 2005 per capita GDP, as it is the most recent year for which that information is available.[8]. For american cities, the population information comes from the Census Bureau. Each city was assigned its Metropolitan Statistical Area's population. Per capita GDP figures -corresponding to 2014- come from the Bureau of Economic Analysis, and as with population figures, each city was assigned the per capita GDP of the Metropolitan Area to which it belongs. Finally, flight's prices and other characteristics, such as being two stops flights or being offered in codeshare agreements, were taken directly from the airlines' websites.

To gather prices, only official flight routes were considered. These routes were obtained from the SCT's General Directorate of Civil Aviation (DGAC, its acronym in spanish), from the 2015 Scheduled International Service Aviation Statistics by Origin-Destination. A total of 492 routes between the United States and Mexico appear in the document, of which 484 were considered

6 Specifically, from the T-100 International Segment (All Carriers) database.

7 To make sure distances were not significantly different to those in the USDOT database, distances for all the routes were taken from www.world-airport-codes.com and then compared to the available distances in the USDOT database. The mean of the USDOT distances is 2070.258 km, with a standard deviation of 793.14 km, a minimum distance of 191.47 km and a maximum distance of 4320.17 km. The average www.world-airport-codes.com distance is 2068.8 km, with a standard dev. of 791 km, a minimum dustance of 191.91 km and a maximum of 4320.39 km. A mean difference test does not allow us to reject the null hypothesis of equal means between the USDOT database ditances and the www.world-airport-codes.com distances, which suggests that using either set of distances -or a combination of both- should not impact the results of the study in a significant way.

8 Mexico City's GDP per capita does not appear directly in the SNIM database. It was calculated as a weighted average of its delegations' per capita GDP.

for this study[9], the reason being that it was not possible to obtain prices for the missing routes, either because prices were not available or airlines were not operating the routes anymore. Only airlines carrying passengers and appearing in the DGAC's Air Carriers Statistics register were included in this work[10]. A total of 15 airlines are included in this study, with 5 of them being of mexican origin and 10 US-based. The mexican airlines are Aeromar, Aeroméxico, Interjet, Vivaaerobus and Volaris, while their american counterparts are Alaska Airlines, American Airlies, Delta Airlines, Frontier Airlines, Jetblue Airways, SunCountry Airlines, Southwest Airlines, Spirit Airlines, United Airlines and Virgin America. This, along with the routes considered, gives a total of 1669 carrier-route combinations.

In order to make prices comparable, a specific price-taking methodology was put in place. Only roundtrip prices were taken, giving preference to non stop or one stop flights[11], and picking always the lowest possible price[12]. To analyze the effects in price of the proximity between daparture and return date, as well as of the closeness between the day the priced was picked up and the departure date, 4 waves of prices were taken. During the first wave, for each carrier-route combination, the lowest price with departure date between October 16 and October 22 and return date between October 23 and October 29 was taken, with the condition that deaprture and return date were at least 4 days apart. For the second wave, the chosen price was the lowest one with departure date between October 16 and October 22, but conditioning that the return date was no more than 3 days after the departure date. For the third and fourth waves the price-taking methodology was simpler. The departure date was set to be October 4, then, for the third wave, the return date was set to be October 11, while for the fourth wave it was October 6. In the end, for each carrier-route combination, the flight fare was observed 4 times, with different departure and return dates and distance between departure and return ranging from 1 to 9 days, depending on the wave. This gives a total of 6,676 observations[13].

Tables 2 and 3 present carriers' summary statistics. To facilitate the analysis, carriers were divided in low cost and non low cost[14].

9 The routes not icluded are Birmingham-Cancún, Brownsville-Puebla, Cancún-Chicago/Rockford, Chicago/Rockford-Cancún, Chicago/Rockford-Puerto Vallarta, Huntsville-Guadalajara, Guadalajara-Huntsville and Toluca-Fort Lauderdale. This routes accounted for 0.16% of the total flights and 0.1% of total passengers transported between Mexico and the US, according to the DGAC data, which makes highly unlikely that not including them will alter the results of the study.

10 There are carriers not appearing in the DGAC's register that offer flights between Mexico and the US. For example, the mexican Magnicharters offers flights in the Monterrey-Dallas and Monterrey-Orlando routes. These carriers were omitted because they probably were buying seats from other airlines, instead of actually providing the transportation service.

11 Prices of flights with two stops were also taken, but only in those cases in which there were not any other available prices.

12 Prices include all applicable taxes.

13 In some carrier-route combinations fares for flights departing in October were not available. In this cases, departure and return dates were chosen to be as close as possible to the wave's departure and return dates.

14 Given that there is no standard definition of "low cost carrier", the low cost carrier status was assigned based on the own airline's webpage information, as many carriers announce themselves as low cost. Nevertheless, several

Table 2: Carrier Summary Statistics. Routes and Price per km

Carrier	# of Routes Offered	Mean Price per km	SD of Price per km	Min Price per km	Max Price per km
Non Low-cost					
Aeromar	2	0.6042513	0.0156823	0.5684965	0.6195743
Aeroméxico	377	0.3670741	0.3133143	0.0776631	3.780493
Alaska Airlines	42	0.2116164	0.0631708	0.121944	0.4284046
American Airlines	101	0.3364468	0.1843927	0.1112184	1.322741
Delta Airlines	148	0.2702338	0.2072239	0.0999475	2.701592
United Airlines	429	0.32854	0.2308671	0.0886748	2.461424
Virgin America	27	0.2191891	0.1040752	0.1071791	0.8820475
Total	*320.4014*	*0.3279936**	*0.2532159*	*0.0776631*	*3.780493*
Low-cost					
Frontier Airlines	71	0.2320357	0.0811968	0.0775643	0.4551716
Interjet	91	0.2075871	0.0770759	0.1046448	0.5290862
Jetblue Airways	12	0.2061898	0.0889263	0.1003278	0.3374574
Southwest Airlines	177	0.194527	0.0769007	0.0920704	0.5630103
Spirit Airlines	45	0.1560422	0.0621349	0.0873514	0.3867111
SunCountry Airlines	33	0.2204109	0.0682972	0.1114057	0.4189412
Vivaaerobus	2	0.2348862	0.018783	0.2212766	0.2575688
Volaris	112	0.1606242	0.1186793	0.0489646	1.341817
Total	*111.3389*	*0.1934174**	*0.0898433*	*0.0489646*	*1.341817*
Total (All)	**252.3841**	**0.28421**	**0.2232841**	**0.0489646**	**3.780493**

Author's elaboration. Prices in dollars.
*Significant difference at a 99% confidence level.

As can be seen from Table 2, United Airlines offers the most routes between Mexico and the United States of any carrier in the sample, followed by Aeroméxico, which services 52 less routes. Consistent with Barnes (2012), low cost carriers offer, on average, less routes than non low cost carriers, since these airlines mainly serve point-to-point markets[15]. The average low cost carrier offers only 111 routes, while the average non low cost carrier offers almost the triple, 320 (although results are mainly driven by United and Aeroméxico). As expected, the mean price per kilometer[16] of non low cost carriers is substantially (69.4%) higher than the mean price per kilometer of low cost airlines, and this difference is significant at a 99% confidence level. There is also greater variability in the price per kilometer of non low cost airlines compared to low cost. Aeromar and Vivaaerobus operate the least number of routes in the sample, with each servicing only two.

The carrier with the lowest average price per kilometer is Spirit, followed closely by Volaris. Aeromar charges the highest average price per kilometer of the airlines in the sample, but it might just be due to the specific routes in which it operates (McAllen-Mexico City and Mexico City-McAllen). If we ignore Aeromar, the highest mean price per kilometer pertains to

of the carriers here classified as low cost have also been assigned low cost status in other works. For example, Southwest, Spirit and Jetblue are all considered low cost carriers in Barnes (2012).

15 Barnes (2012) defines "point-to-point" as non stop flights designed to primarily carry local passengers.

16 Please note that in this and following sections the use of the term "mean price per kilometer" refers to the mean *lowest* price per kilometer that carriers charge. The actual mean fares charged by carriers may behave differently.

Table 3: Carrier Summary Statistics. Observations and Flights Distances

Carrier	N	Mean Distance	SD of Distance	Min Distance	Max Distance
Non Low-cost					
Aeromar	8	751.403	0	751.403	751.403
Aeroméxico	1508	2064.93	797.139	205.952	4320.165
Alaska Airlines	168	2257.427	751.7913	1113.428	4320.165
American Airlines	404	1798.448	607.0194	489.136	3086.062
Delta Airlines	592	2365.708	761.5936	445.693	4320.165
United Airlines	1716	2097.747	779.2813	445.693	4320.165
Virgin America	108	2915.18	831.1353	1290.418	3874.472
Total	*4,504*	*2118.299**	*792.486*	*205.952*	*4320.165*
Low-cost					
Frontier Airlines	284	2454.065	613.2389	1465.799	4320.165
Interjet	364	1788.438	837.5211	445.693	3874.472
Jetblue Airways	48	1883.603	722.159	883.341	2790.006
Southwest Airlines	708	2344.872	763.4476	801.282	4320.165
Spirit Airlines	180	2123.379	769.7007	883.341	3409.471
SunCountry Airlines	132	2783.619	895.2853	801.282	4320.165
Vivaaerobus	8	661.299	0	661.299	661.299
Volaris	448	2158.176	685.6749	205.952	3574.662
Total	*2,172*	*2219.304**	*798.2667*	*205.952*	*4320.165*
Total (All)	**6676**	**2151.16**	**795.72**	**205.952**	**4320.165**

Author's elaboration with data from the DOT and www.world-airport-codes.com.
*Significant difference at a 99% confidence level.

Aeroméxico, charging almost 37 cents per kilometer on the average route. Aeroméxico has also the greatest variability in the price per kilometer it charges, as its minimum price per kilometer is the lowest among non low cost carriers and its maximum is the highest of all the sample. It's curious that a similar phenomenom occurs among low cost carriers, and that also belongs to a mexican carrier. Volaris charges the minimum price per kilometer of all the sample and also the maximum price per kilometer among low cost carriers. It's worth noting that some carriers classified as non low cost have lower mean prices per kilometer than some low cost carriers. This might be, however, due to the small number of routes being considered for these carriers. Another possibility is that the way of operating differs in international and domestic markets, making Alaska and Virgin's mean fares higher than those of Frontier or SunCountry in flights inside the United States (Tables 9 and 10 in the Appendix present the same information as Tables 2 and 3, but separating carriers by country of origin).

Table 3 presents the number of observations for each carrier and some summary statistics of flights distances. Since every price was observed four times for each carrier-route combination, the number of obervations for each carrier equals $4 \times \#ofRoutesOffered$. Then, the carriers with the highest number of observations in the sample are United Airlines and Aeroméxico, while the carriers with the least observations are Aeromar and Vivaaerobus. Practically one third of the observations in the sample correspond to low cost carriers. SunCountry Airlines travels the longest distances per flight, on average, while Vivaaerobus the lowest. Again, this may be due to the small number of routes in which Viva operates (it operates the Monterrey-Houston and Houston-Monterrey routes). If we ignore Vivaaerobus and Aeromar, the airline flying the shortest routes, on average, is Interjet, with an average distance of 1,788.43 kilometers between origin and destination airports. Notice that Aeromar and Vivaaerobus' standard deviation for the distances they travel is zero. This is simply because both airlines only operate between two cities in this sample, thus there is not variation in the distace they travel. Low cost carriers serve, on average, longer routes than non low cost carriers, and this difference is significant at a 99% confidence level. Since many airlines serve the same routes, it should not come as a surprise that some of the minimum and maximum flight distances coincide among different airlines. The longest direct route distance in the sample is between Cancún and Seattle, with 4,320.17 kilometers, and the shortest is from Tijuana to Los Angeles, with 206 kilometers.

3 Econometric Specification

Several specifications are estimated, including structural and fixed effects models. The first model to estimate is of the form

$$Y = X\beta + U. \tag{1}$$

Y is a vector with the dependent variable's sample values, X is a matrix containing the explanatory variables' values and U is the stochastic error term. This type of models assume that $E[U|X] = 0$ for estimates to be unbiased. In this case, the dependent variable is the neperian logarithm of the price per kilometer of all carrier-route combinations. The explanatory variables are a dummy variable indicating if a low cost carrier operates the route, as it is of interest to determine if and how airlines respond to the presence of low cost carriers in a route; the number of carriers operating the route, as we can expect that the higher the number of competitors the higher the competitive pressure will be, thus forcing airlines to reduce prices; the number of carriers that operate the origin city and the number of carriers operating the destination city (Table 12 in the Appendix shows descriptive statistics for all the cities in the routes of this study), as a sign not only of actual but also of potential competition; the number of days between the departure and return date, as well as the number of days between the departure date and the day the price was taken, as we would expect that the closer the departure date is from the purchase date, the higher the price would be[17]; dummies indicating if the origin or destination city is a hub of a competing carrier (Table 11 in the Appendix shows a list of the hub cities for each carrier in the sample), because we would expect this to be a source of competitive pressure among carriers; a dummy equal to one if the flight is also offered in a codeshare agreement, as

17 This suits well with a point made by Barnes (2012) in which she states that airlines differentiate customers in business and leisure travelers, with business travelers being less price-sensitive and showing a willingness to pay more for flights that better suit their schedule needs.

it is of interest to determine how these agreements affect prices and thus customers; a dummy indicating if the flight is a two stops flight; a dummy equal to one if the origin city is Mexico City, as the coefficient on this variable would indicate if airlines are able to charge higher prices due to Mexico City's airport saturation conditions; and the direct flight distance, its square, per capita GDP of origin and destination and the geometric mean of the origin and destination populations as route-specific controls (Table 8 in the Appendix presents summary statistics for the variables used in the regressions).

Given the omitted variables concerns (as there is no information regarding airports' use cost or touristic city status for origin and destination, variables that can have an effect in the price per kilometer), the second type of models to estimate are fixed effects models. Due to the fact that many of the explanatory variables do not vary throughout our sample, these models were estimated with dummy variables. The main fixed effects specification is as follows

$$\begin{aligned} lnP_{irw} =& \beta_0 + \beta_1 Distance_r + \beta_2 Distancesquared_r \\ &+ \beta_3 Daysbetweendepartureandreturn_{irw} \\ &+ \beta_4 Daysbetweentakingthepriceanddeparture_{irw} \\ &+ \beta_5 \#ofcarriersintheroute_r + \beta_6 LCCintheroute_r \\ &+ \beta_7 MexicoCityorigin_r + \beta_8 Codeshareflight_{ir} \\ &+ \beta_9 Twostopsflight_{ir} + \sum_{j=1}^{90} \phi_j City_j + \varepsilon_{irw}, \end{aligned} \tag{2}$$

where the subscript *i* represents the carrier, *r* the route and *w* the wave during which the price was observed. As the name of the variable indicates, *Days between departure and return* are the number if days between the flight's departure date and its return date. The same logic applies to *Days between taking the price and departure*. Note that these two variables depend not only on the carrier and the route, but also on the wave in which the price was oberved. *# of carriers in the route* is the number of carriers operating route *r*. *LCC in the route* is an idicator variable equal to 1 if there is at least one low cost carrier operating in route *r*. *Mexico City origin* is a dummy that indicates if the flight's origin is Mexico City. *Codeshare flight* indicates if the airline *i* offers the route *r* in a codeshare agreement with other airline, although it doesn't have to be exclusively offered in codeshare. The sum term represents the city fixed effects and ε_{irw} is the error term. An specification including carrier fixed effects is also estimated, as well as other modifications of the main equation.

4 Estimation Results

This section presents the results of estimating the various specifications previously mentioned. Each subsection presents the estimates for each of the different models.

4.1 Structural Models

Table 4 presents the results of estimating equation (1). In both columns the dependent variable is the neperian logarithm of the price per kilometer for each carrier-route combination.

Column (1) includes the number of carriers as explanatory variable, while column (2) replaces this variable with the number of carriers operating the origin and destination cities of the route. It is important to note that coefficients do not vary significantly between columns. In both columns the effect of distance on the price per kilometer is negative and statistically significant, although it is small, implying that a 1% increase in the route's distance would decrease the price per kilometer 0.001%. As expected, the number of carriers in the route has a negative impact on the price per kilometer. The coefficient implies that, on average, the addition of one new carrier to the route will reduce the price per kilometer approximately 2.6% ($e^{-0.261} = 0.974$). The effect of having a low cost carrier operating in the route is much higher, reducing the price per kilometer 20%, on average. This result holds for both columns. It is interesting that the number of days between departure and return does not have a statistically significant effect on the price, but the number of days between the day the price was taken and the departure date does have a negative and significant effect on the price. The estimate's magnitude is very similar in both columns as well.

The geometric mean of the origin and destination's populations and the per capita GDP of origin and destination also have a negative relationship with the price per kilometer. This may indicate that in bigger markets, or in markets with more purchasing power, carriers compete more agressively to obtain market share, with estimates being similar across columns. Both the first and second column show that departing from a competitor's hub city causes an increase in the price per kilometer between 2.6% and 3.1%. This result fits well with the literature, as it signals that carriers departing from a competitor's hub compete less agressively in prices, due to the market power possessed by the dominant firm. It is also possible that when airlines use the hubs of other carriers they face higher airport costs, as their competitor tries to deter participation in that market. In the first column, the effect of arriving at a competitor's hub city is positive and statistically significant as well, but in the second column the effect becomes statistically insignificant. Moreover, the coefficient on the Codeshare dummy indicates that prices of flights offered through codeshare agreements are approximately 30% higher than prices of flights that aren't. The effect on the Two Stops dummy implies a 20% increase in the price per kilometer of the lowest fares, on average. This result seems counterintuitive, as one would

Table 4: Regression Estimates. Structural Models

	(1)	(2)
[1em] Distance	-0.000988***	-0.000992***
	(0.0000297)	(0.0000297)
Distance Squared	0.000000135***	0.000000137***
	(6.16e-09)	(6.16e-09)
# of carriers in the route	-0.0261***	
	(0.00295)	
LCC in the route	-0.227***	-0.223***
	(0.0117)	(0.0116)
Days between departure and return	-0.00118	-0.00134
	(0.00155)	(0.00155)
Days between taking the price and departure	-0.000681***	-0.000651***
	(0.0000999)	(0.000100)
Origin's per capita GDP	-0.00000186***	-0.00000129***
	(0.000000366)	(0.000000377)
Destination's per capita GDP	-0.00000161***	-0.000000801**
	(0.000000352)	(0.000000363)
Endpoints Populations' Geometric Mean	-2.52e-08***	-2.42e-08***
	(2.23e-09)	(2.28e-09)
Origin is competitor's hub	0.0257***	0.0304***
	(0.00991)	(0.0102)
Destination is competitor's hub	0.0206**	0.0138
	(0.0101)	(0.0101)
Codeshare flight	0.261***	0.253***
	(0.00963)	(0.00953)
Two stops flight	0.184***	0.174***
	(0.0165)	(0.0161)
Mexico City origin	-0.0212	-0.0338*
	(0.0192)	(0.0195)
Origin carriers		-0.0153***
		(0.00171)
Destination carriers		-0.0127***
		(0.00168)
_cons	0.501***	0.566***
	(0.0482)	(0.0495)
N	6676	6676
R^2	0.616	0.618

Robust standard errors in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
The dependent variable is the neperian logarithm of the price per km in both columns.

expect that two stops flights are regarded as a lower quality service, reducing consumers' willingness to pay for them, thus prompting airlines to give a price discount in those flights. It is worth noting that the coefficient estimates for the Mexico City origin dummy are negative in both columns, and the coefficient is statistically significant at a 90% confidence level in the second column. Nevertheless, this result may be driven by omitted variables. In the following sections we will see how estimates change once we include fixed effects. Lastly, as shown in the second column, if instead of including the number of carriers in the route as an explanatory variable we include the number of carriers operating destination and the number of carriers operating origin, we find that both variables have a negative and significant impact on the price per kilometer, in line with the results of Goolsbee and Syverson (2008).

4.2 Fixed Effects Models

In this subsection, the results of estimating the fixed effects models are presented. Table 5 presents the estimations of the preferred model, the one with fixed effects per city. Column (1) includes the number of carriers in the route as explanatory variable, excluding the low cost carrier dummy. Column (2) includes the low cost carrier dummy but excludes the number airlines in the route and column (3) includes both variables as explanatory. In all the columns the dependent variable is the neperian logarithm of the flight's price per kilometer for each carrier-route combination.

As in the structural model estimates, coefficients are very similar across columns. The effect of distance on the price per kilometer is negative and statistically significant at a 99% confidence level in all three columns. Plus, the magnitude of the effect is very similar to the estimated magnitude in the previous subsection. The coefficient in the number of carriers operating the route is of -0.0186, implying an average reduction of 1.7% in the price per kilometer that carriers charge, for every new carrier that enters the route. Once the low cost carrier dummy is added, in column (3), the estimate is still negative and significant, but the implicit effect is 35% lower, signaling a 1.1% reduction in the price per kilometer for every new entrant in the route. Once again, the number of days between departure and return does not have a statistically significant effect on the price per kilometer, but the number of days between the day the price was taken and the departure date inlfuences the dependent variable negatively. Flights that are also offered in a codeshare agreement are between 26.5% and 27.8% more expensive per kilometer, on average, than those flights that aren't, while two stops flights are between 16% and 17.1% more expensive than non stop or one stop flights.

It is important to note that the effect of departing from the Mexico City's airport is now positive, but imprecisely estimated. The effect of a low cost carrier servicing the route is, once again, bigger in magnitude than the effect of the number of carriers in the route, and enters the estimation with negative sign as well. The -0.143 estimate implies that airlines decrease prices

Table 5: Regression Estimates. Fixed effects per city

	(1)	(2)	(3)
Distance	-0.00105***	-0.00103***	-0.00103***
	(0.0000430)	(0.0000433)	(0.0000432)
Distance squared	0.000000147***	0.000000142***	0.000000141***
	(7.84e-09)	(7.89e-09)	(7.88e-09)
# of carriers in the route	-0.0186***		-0.0109**
	(0.00541)		(0.00539)
Days between departure and return	-0.00156	-0.00149	-0.00148
	(0.00147)	(0.00146)	(0.00146)
Days between taking the price and departure	-0.000389***	-0.000400***	-0.000407***
	(0.000104)	(0.000102)	(0.000102)
Codeshare flight	0.245***	0.235***	0.237***
	(0.00940)	(0.00937)	(0.00940)
Two stops flight	0.158***	0.148***	0.148***
	(0.0167)	(0.0168)	(0.0168)
Mexico City origin	0.0118	0.0126	0.0128
	(0.0181)	(0.0181)	(0.0181)
LCC in the route		-0.143***	-0.137***
		(0.0146)	(0.0146)
_cons	0.458**	0.486**	0.460**
	(0.192)	(0.192)	(0.192)
N	6676	6676	6676
R^2	0.665	0.669	0.669

Robust standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The dependent variable is the neperian logarithm of the price per km in the three columns. All the estimations include city fixed effects.

by 13.4% on average on routes where there is presence of at least one low cost carrier. In the third column, when both the number of carriers and the low cost dummy are included in the regression, the low cost dummy maintains its predictive power, while, as has been previously mentioned, the size of the coefficient on the number of carriers in the route decreases. This result, nevertheless, indicates that, independently of the presence of low cost carriers in the route, the number of competitors applies competitive pressure to the carriers, forcing them to reduce their prices in order to be more attractive to customers. Table 6 contains the estimates from a regression including carrier and city fixed effects. Again, column (1) includes the number of carriers in the route as explanatory variable but not the low cost dummy. Column (2) includes the low cost dummy but excludes the number of carriers and column (3) incorporates both.

Table 6: Regression Estimates. Fixed effects per city and carrier

	(1)	(2)	(3)
Distance	-0.00103***	-0.00102***	-0.00102***
	(0.0000365)	(0.0000369)	(0.0000368)
Distance squared	0.000000136***	0.000000134***	0.000000134***
	(6.79e-09)	(6.87e-09)	(6.86e-09)
# of carriers in the route	-0.00743		-0.00436
	(0.00465)		(0.00465)
Days between departure and return	-0.000758	-0.000739	-0.000738
	(0.00127)	(0.00127)	(0.00127)
Days between taking the price and departure	-0.000284**	-0.000298***	-0.000297***
	(0.000112)	(0.000112)	(0.000112)
Codeshare flight	0.146***	0.144***	0.144***
	(0.0106)	(0.0106)	(0.0106)
Two stops flight	0.125***	0.121***	0.121***
	(0.0158)	(0.0159)	(0.0159)
Mexico City origin	0.0127	0.0131	0.0131
	(0.0151)	(0.0151)	(0.0151)
LCC in the route		-0.0566***	-0.0542***
		(0.0128)	(0.0127)
_cons	-0.0363	-0.0313	-0.0297
	(0.0623)	(0.0621)	(0.0622)
N	6676	6676	6676
R^2	0.759	0.759	0.759

Robust standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The dependent variable is the neperian logarithm of the price per km in the three columns. All the estimations include city and carrier fixed effects.

As in Tables 3 and 4, the average effect of direct flight distance on the price per kilometer is small but statistically significant at a 99% confidence level in all columns. There is no effect of the distance between departure date and return date, but the coefficient on the distance between the day the price was picked up and the departure date continues to be negative and significant, although in this case it's lower than in the previous estimations.

The impact on the price of codeshare agreements sees its predictive power greatly reduced, as the coefficient in the codeshare dummy is approximately 40% lower than in the specification including only fixed effects per city, but it still is significant at a 99% level in all columns.

The coefficient in the two stops dummy is also lower, although it didn't decrease as much as the codeshare coefficient, going from around -0.15 in the model with city fixed effects to -0.12 in the model with city and carrier fixed effects. The coefficient estimates on the Mexico City origin dummy are practically unchanged, and continue being statistically insignificant. Probably the biggest surprise of the results in Table 5 is that the number of carriers in the route does not affect the price per kilometer significatively. The effect of having a low cost carrier operating in the route keeps its significance, but it's now much lower, down to -0.05 from -0.14. As in the previous model, including both the number of carriers and the low cost carrier dummy reduces the coefficient in the former variable but does not significantly affect the estimate on the latter.

4.3 Alternative Specifications

Finally, it is of interest to explore if the results vary by carrier type. A model is also estimated in which the objective is to identify possibly different effects of departing from Mexico City for each carrier. Table 7 presents these estimations. In column (1) the dependent variable is the neperian logarithm of the prices per kilometer of all carriers not considered to be low cost. In column (2) the dependent variable is the logarithm of the prices per kilometer of only low cost carriers. In both columns fixed effects per city and carrier were included. Column (3) presents the results of estimating a model as those from Table 5, with city fixed effects, but including also interactions of carriers with the dummy indicating Mexico City origin.

As has been seen in all the previous models, the effect of distance in the price per kilometer is negative and significant. Moreover, it doesn't differ greatly from low cost to non low cost carriers. An interesting finding is that, for non low cost carriers, the effect of a low cost carrier operating the route is not statistically significant (the coefficient estimate is positive but not significant), implying that low cost carriers do not discipline their non low cost counterparts. This result does not necessarily mean that these types of carriers belong to a different relevant market. Rather, it might be a reflect that non low cost carriers focus on certain types of customers or offer certain services that low cost carriers do not, such as more routes -as one observes in Table 2- or flexible itineraries, which allow them to keep their prices high even when they compete against low cost airlines[18]. On the other hand, the number of carriers in the route does have a negative and significant impact on the price per kilometer of non low cost carriers. The coefficient of -0.0266 means that, on average, an increase of one in the number of competitors in the route will reduce non low cost carriers' prices by 2.6%. Once again, prices per kilometer of flights offered through codeshare agreements are higher than prices of flights not offered in codeshare. The effect of departing from Mexico City is positive, but not statistically significant.

18 Fageda, Jiménez and Suárez-Alemán (2014) find that the perceived quality of bigger airlines is higher, along with the fact that the perceived quality of regional carriers is not as high as that of carriers using mainline jets. This may also help explain why non low cost carriers are able to charge higher prices.

Table 7: Regression Estimates. Alternative specifications

	(1)	(2)	(3)
	Non Low Cost Carriers	Low Cost Carriers	All Carriers
Distance	-0.00109***	-0.000928***	-0.00105***
	(0.0000528)	(0.0000337)	(0.0000428)
Distance squared	0.000000146***	0.000000115***	0.000000145***
	(9.47e-09)	(6.73e-09)	(7.81e-09)
# of carriers in the route	-0.0266***	0.00172	-0.0160***
	(0.00648)	(0.00505)	(0.00541)
LCC in the route	0.0227		
	(0.0147)		
Days between departure and return	-0.000874	0.000409	-0.00141
	(0.00160)	(0.00142)	(0.00145)
Days between taking the price and departure	0.000449**	-0.000781***	-0.000389***
	(0.000228)	(0.000122)	(0.000104)
Codeshare flight	0.143***		0.244***
	(0.0109)		(0.00969)
Two stops flight	0.0749***	0.107***	0.157***
	(0.0184)	(0.0201)	(0.0165)
Mexico City origin	0.00752	0.0310**	0.0546***
	(0.0196)	(0.0147)	(0.0203)
Aeromar*Mexico City origin			-0.173***
			(0.0404)
Aeroméxico*Mexico City origin			0.132***
			(0.0332)
American*Mexico City origin			0.0738
			(0.0731)
Delta*Mexico City origin			-0.150***
			(0.0329)
Interjet*Mexico City origin			-0.219***
			(0.0388)
Jetblue*Mexico City origin			-0.494***
			(0.0364)
Southwest*Mexico City origin			-0.168***
			(0.0244)
United*Mexico City origin			0.129***
			(0.0258)
Volaris*Mexico City origin			-0.273***
			(0.0274)
_cons	-0.114	0.0274	0.459**
	(0.0844)	(0.0751)	(0.192)
N	4504	2172	6676
R^2	0.730	0.835	0.673

Robust standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

In column (1) the dependent variable is the neperian logarithm of the prices per km of non low cost carriers. In column (2) the dependent variable is the neperian logarithm of the prices per km of low cost carriers. In column (3) the dependent variable is the neperian logarithm of the prices per km for all the carrier-route combinations in the sample. Estimations in columns (2) and (3) include city and carrier fixed effects. The column (3) estimation includes fixed effects per city.

Low cost carriers, on the other way, do not seem to be affected by the presence of more carriers in the route, but departing from Mexico City does increase the price per kilometer they charge, on average. The increase in price that low cost carriers experience for flights with two stops is higher than the estimated effect for non low cost carriers. Since there are no low cost carrier observations in which the flight was also offered in a codesahre agreement, the effect of this variable is not estimated for this type of carriers.

In the third column, where the estimation was done with all the prices in the sample and including fixed effects per city, we can see similar results to those observed in Table 5. The impact of distance on the price per kilometer is negative and significant, with the size of the effect being basically the same as in previous regressions. The number of carriers in the route is negatively correlated with the price per kilometer, as expected, and two stops flights and flights offered in codeshare are, on average, more expensive per kilometer. We can clearly see now that the coefficient on the dummy indicating departure from Mexico City is positive and statistically significant at a 99% level. The estimate indicates that flights departing from Mexico City are, on average, 5.6% more expensive on a per kilometer basis than flights departing from another city. Regarding the coefficients on the interactions, notice that six airlines do not appear in the table. Five of them were not included due to not having any flights touching Mexico City [19]. The other carrier missing, Alaska, was omitted to avoid multicollinearity. We can interpret the coefficients as the effect of departing from Mexico City for each carrier, relative to Alaska Airlines. Note that the coefficients on the interactions with low cost carriers are negative and significant, indicating that those carriers charge significantly lower prices per kilometer departing from Mexico City than Alaska. This was expected, as Alaska is not considered a low cost carrier. Aeroméxico and United Airlines charge higher prices per kilometer departing from Mexico City, on average, than Alaska. Nevertheless, these coefficients should be interpreted with caution, as there are only 4 observations with Alaska's flights departing from Mexico City in the sample.

5 Conclusions

This work has looked into the price determinants of flights between Mexico and the United States. With a database of more than 6,600 roundtrip flight prices, spanning 484 routes and 15 carriers, several econometric specifications were estimated. The main results are robust to these various specifications.

There is a consistent negative relationship between the lowest prices per kilometer and flight distance. Although the magnitude of the coefficient is small, it is significant at a 99% level

19 The missing carriers are Frontier, Spirit, SunCountry, Vivaaerobus and Virgin America.

across specifications and even after dividing the sample in low cost and non low cost carriers. The number of carriers operating the route has a negative impact in the lowest prices per kilometer, with coefficients indicating that one new entrant in the route would decrease the lowest price per kilometer between 1.8% and 2.6%. The effect of a low cost carrier operating the route is even higher, as OLS estimates of the structural regression model imply a 20% per kilometer price reduction when there is presence of a low cost carrier in the route. The effect is lower once city and carrier fixed effects are included, down to a 13.4% price decrease in the model with city fixed effects and to 5.5% when carrier fixed effects are added. It's worth noting that non low cost carriers are not disciplined by low cost carriers, as they do not respond to the presence of a low cost carrier in a route, but they do respond to a higher number of competitors in the route by decreasing their price per kilometer. Also, across all specifications, there is not effect of the number of days between departure and return on the price per kilometer. On the other side, results indicate that the closer the departure date is from the day the price was taken, the higher the price per kilometer will be. It is also consistently found that the price per kilometer of flights with two stops or offered in codeshare is higher than the price per kilometer of non stop or one stop flights and of flights not offered through codeshare, respectively. There is also evidence that airlines are able to charge an overprice in flights departing from Mexico City, probably due to the Benito Juárez International Airport saturation conditions.

Although it is out of the scope of this work to analyze the possible implications of the bilateral agreement signed by the mexican and american governments this past december, the evidence found points to a possibly positive effect of the agreement, promoting competition and thus reducing prices and benefiting consumers, but there's certainly more work to be done on this subject.

Appendix

In this section more descriptive statistics are presented. Table 8 shows summary statistics for all the variables used in the regressions (with the exception of distance squared). There are, on average, 4 carriers operating each route, 31% of the observations in the sample are flights that are also offered in a codeshare agreement, and more than 50% of both origins and destinations are hub cities for a carrier. Only 7% of the flights in the sample depart from Mexico City, and 7% are two stops flights as well. Notice the high presence of low cost carriers, as 80% of the routes considered are serviced by at least one low cost carrier.

Tables 9 and 10 present the same statistics as tables 2 and 3, but this time separating carriers by country of origin. Mexican carriers charge higher prices and their fares are more volatile than those of american carriers. The price difference is significant at a 99% confidence level. Also, notice that, on average, american carriers service longer routes than mexican carriers, and

Table 8: Summary Statistics. Regression Variables

Variable	N	Mean	SD	Min	Max
Price per km	6676	0.28421	0.2232841	0.0489646	3.780493
Distance	6676	2151.16	795.7201	205.952	4320.165
Geo. mean of both ends' populations	6676	2373934	2146500	244324.1	1.32E+07
Per capita GDP of origin	6676	38046.97	23743.97	6214	105482
Per capita GDP of destination	6676	36937.14	23668.58	6214	105482
# of carriers in the route	6676	4.098562	1.621353	1	10
Carriers servicing origin	6676	8.203116	3.085609	1	13
Carriers Servicing destination	6676	8.243259	3.176999	1	13
Two stops flight	6676	0.0727981	0.2598242	0	1
Codeshare flight	6676	0.3151588	0.4646139	0	1
Origin is competitor's hub	6676	0.5668065	0.4955539	0	1
Destination is competitor's hub	6676	0.5572199	0.4967523	0	1
LCC in the route	6676	0.8018274	0.3986527	0	1
Days between departure and return	6676	4.465548	2.517447	1	9
Days between taking price and return	6676	201.5027	41.90474	3	285
Mexico City Origin	6676	0.0724985	0.259331	0	1

Author's elaboration.

this difference is also significant at a 99% confidence level. Nevertheless, it is worth noting that the mexican carriers' averages may be driven by Aeroméxico's observations.

Table 11 displays the cities that serve as hubs for each of the carriers in the sample, as they appear in the carriers' websites. American Airlines and Delta Airlines are the carriers with the most cities as hubs, each having 9. On the other hand, according to their websites, Aeromar and Southwest Airlines do not count with any hubs.

Table 12 presents descriptive statistics for all the cities that formed part of the routes considered in the study. The total number of cities is 90, out of which 85 appear as origins, while the 90 cities appear as destinations. The cities that do not appear as origins are Ciudad Obregón, Nuevo Laredo, Brownsville, Buffalo and Laredo. The maximum number of carriers operating in a city is 13, for the city of Cancún. Also, Cancún is the city that forms part of the highest number of routes, with 38. Other cities that are included in a good share of routes are Guadalajara, Houston, San José del Cabo and Mexico City. Finally, Table 13 presents descriptive statistics, such as average price per km, distance and carriers operating the route for each of the 484 routes in the sample.

Table 9: Carriers per country of origin. Summary Statistics

Carrier	# of Routes Offered	Mean Price per km	SD of Price per km	Min Price per km	Max Price per km
Mexican carriers					
Aeromar	2	0.604	0.016	0.568	0.620
Aeroméxico	377	0.367	0.313	0.078	3.780
Interjet	91	0.208	0.077	0.105	0.529
Vivaaerobus	2	0.235	0.019	0.221	0.258
Volaris	112	0.161	0.119	0.049	1.342
Total	*279*	*0.303**	*0.274*	*0.049*	*3.780*
American carriers					
Alaska Airlines	42	0.212	0.063	0.122	0.428
American Airlines	101	0.336	0.184	0.111	1.323
Delta Airlines	148	0.270	0.207	0.100	2.702
Frontier Airlines	71	0.232	0.081	0.078	0.455
Jetblue	12	0.206	0.089	0.100	0.337
Southwest Airlines	177	0.195	0.077	0.092	0.563
Spirit Airlines	45	0.156	0.062	0.087	0.387
SunCountry Airlines	33	0.220	0.068	0.111	0.419
United Airlines	429	0.329	0.231	0.089	2.461
Virgin America	27	0.219	0.104	0.107	0.882
Total	*238*	*0.274**	*0.189*	*0.078*	*2.702*
Total (All)	**252.3841**	**0.28421**	**0.2232841**	**0.0489646**	**3.780493**

Author's elaboration. Prices in dollars.

*Significant difference at a 99% confidence level.

Table 10: Carriers per country of origin. Summary Statistics

Carrier	N	Mean Distance	SD of Distance	Min Distance	Max Distance
Mexican carriers					
Aeromar	8.0	751.4	0.0	751.4	751.4
Aeroméxico	1,508.0	2,064.9	797.1	206.0	4,320.2
Interjet	364.0	1,788.4	837.5	445.7	3,874.5
Vivaaerobus	8.0	661.3	0.0	661.3	661.3
Volaris	448.0	2,158.2	685.7	206.0	3,574.7
Total	*2,336*	*2,030.4**	*796.4*	*206*	*4,320.2*
American carriers					
Alaska Airlines	168.0	2,257.4	751.8	1,113.4	4,320.2
American Airlines	404.0	1,798.4	607.0	489.1	3,086.1
Delta Airlines	592.0	2,365.7	761.6	445.7	4,320.2
Frontier Airlines	284.0	2,454.1	613.2	1,465.8	4,320.2
Jetblue	48.0	1,883.6	722.2	883.3	2,790.0
Southwest Airlines	708.0	2,344.9	763.4	801.3	4,320.2
Spirit Airlines	180.0	2,123.4	769.7	883.3	3,409.5
SunCountry Airlines	132.0	2,783.6	895.3	801.3	4,320.2
United Airlines	1,716.0	2,097.7	779.3	445.7	4,320.2
Virgin America	108.0	2,915.2	831.1	1,290.4	3,874.5
Total	*4,340*	*2,216.1**	*787.8*	*445.7*	*4,320.2*
Total (All)	**6676**	**2151.16**	**795.72**	**205.952**	**4320.165**

Author's elaboration with data from the DOT and www.world-airport-codes.com.

*Significant difference at a 99% confidence level.

Table 11: Hub cities per carrier

Carrier	Hub cities
Aeromar	–
Aeroméxico	Mexico City, Monterrey, Guadalajara, Hermosillo
Alaska Airlines	Los Angeles, Portland
American Airlines	Chicago, Los Angeles, Phoenix, Dallas-Forth Worth, Miami, Charlotte, Philadelphia, New York, Washington
Delta Airlines	Atlanta, Salt Lake City, Seattle, Los Angeles, Minneapolis-St. Paul, Cincinnati, Boston, New York, Detroit
Frontier Airlines	Denver
Interjet	Mexico City, Toluca
Jetblue Airways	New York
Southwest Airlines	–
Spirit Airlines	Fort Lauderdale
SunCountry Airlines	Minneapolis-St. Paul
United Airlines	Chicago, Denver, Houston, Los Angeles, Newark, San Francisco, Washington
Virgin America	San Francisco
Vivaaerobus	Monterrey, Mexico City, Cancún, Guadalajara
Volaris	Cancún, Guadalajara, Monterrey, Tijuana

Author's elaboration with information from the airlines' websites.

Table 12: Cities in the study. Descriptive statistics

City	2014/2005 per capita GDP	2010 population	# of carriers that offer service	# of routes that include the city	Hub City
Acapulco	7,598.000	789,971.000	3.000	8.000	0.000
Aguascalientes	12,193.000	797,010.000	4.000	4.000	0.000
Atlanta	53,104.000	5286728.000	6.000	8.000	1.000
Austin	54,909.000	1716289.000	2.000	4.000	0.000
Baltimore	57,291.000	2710489.000	5.000	3.000	0.000
Boston	74,746.000	4552402.000	7.000	2.000	1.000
Brownsville	20,047.000	406,220.000	1.000	1.000	0.000
Buffalo	44,114.000	1135509.000	2.000	1.000	0.000
CancúN	17,058.000	661,176.000	13.000	38.000	1.000
Charlotte	55,114.000	2217012.000	3.000	4.000	1.000
Chicago	58,375.000	9461105.000	8.000	12.000	1.000
Chihuahua	16,472.000	819,543.000	4.000	3.000	0.000
Ciudad Del Carmen	15,774.000	221,094.000	3.000	1.000	0.000
Ciudad ObregóN	10,940.000	409,310.000	2.000	1.000	0.000
Cleveland	55,128.000	2077240.000	5.000	1.000	0.000
Columbus, Ohio	54,193.000	1901974.000	4.000	1.000	0.000
Cozumel	16,127.000	79,535.000	6.000	10.000	0.000
Dallas-Fort Worth	66,168.000	6426214.000	9.000	18.000	1.000
Denver	61,903.000	2543482.000	6.000	8.000	1.000
Detroit	51,171.000	4296250.000	5.000	6.000	1.000
Durango	9,288.000	582,267.000	2.000	3.000	0.000
Fort Lauderdale	46,104.000	5564635.000	5.000	5.000	1.000

Author's elaboration with data from the Census Bureau, SNIM and Bureau of Economic Analysis.

Table 12: Cities in the study. Descriptive statistics (Continued)

City	2014/2005 per capita GDP	2010 population	# of carriers that offer service	# of routes that include the city	Hub City
Fort Myers	31,629.000	618,754.000	3.000	1.000	0.000
Fresno	34,018.000	930,450.000	4.000	1.000	0.000
Guadalajara	14,281.000	1495189.000	7.000	25.000	1.000
Hermosillo	15,310.000	784,342.000	3.000	2.000	1.000
Houston	70,097.000	5920416.000	9.000	27.000	1.000
Huatulco	6,214.000	38,629.000	4.000	3.000	0.000
Huntsville	50,019.000	417,593.000	1.000	1.000	0.000
Indianapolis	58,117.000	1887877.000	5.000	2.000	0.000
Ixtapa Zihuatanejo	8,702.000	118,211.000	8.000	7.000	0.000
Kansas City	54,123.000	2009342.000	5.000	3.000	0.000
La Paz	18,726.000	251,871.000	3.000	2.000	0.000
Laredo	26,437.000	250,304.000	1.000	1.000	0.000
Las Vegas	41,807.000	1951269.000	10.000	5.000	0.000
LeóN/Del BajíO	12,668.000	1436480.000	6.000	7.000	0.000
Loreto	13,657.000	16,738.000	1.000	1.000	0.000
Los Angeles	60,148.000	12800000.000	12.000	19.000	1.000
Louisville, Kentucky	48,629.000	1235708.000	1.000	2.000	0.000
Manzanillo	12,995.000	161,420.000	5.000	4.000	0.000
MazatláN	11,564.000	438,434.000	8.000	5.000	0.000
Mcallen	19,846.000	774,769.000	2.000	1.000	0.000
Memphis	47,357.000	1324829.000	3.000	4.000	0.000
Mexicali	12,512.000	936,826.000	2.000	1.000	0.000

Author's elaboration with data from the Census Bureau, SNIM and Bureau of Economic Analysis.

Table 12: Cities in the study. Descriptive statistics (Continued)

City	2014/2005 per capita GDP	2010 population	# of carriers that offer service	# of routes that include the city	Hub City
Mexico City	14,278.470	8851080.000	10.000	29.000	1.000
Miami	46,104.000	5564635.000	5.000	5.000	1.000
Milwaukee	57,279.000	1555908.000	5.000	2.000	0.000
Minneapolis	62,054.000	3348859.000	7.000	8.000	1.000
Monterrey	16,855.000	1135550.000	7.000	11.000	1.000
Morelia	13,176.000	729,279.000	4.000	9.000	0.000
MéRida	16,234.000	830,732.000	5.000	2.000	0.000
Nashville	54,928.000	1670890.000	4.000	1.000	0.000
New Orleans	54,385.000	1189866.000	4.000	1.000	0.000
New York	70,830.000	19600000.000	11.000	6.000	1.000
Newark	70,830.000	19600000.000	3.000	4.000	1.000
Nuevo Laredo	11,667.000	384,033.000	1.000	1.000	0.000
Oakland	80,643.000	4335391.000	3.000	5.000	0.000
Oaxaca	13,018.000	263,357.000	3.000	1.000	0.000
Ontario	27,620.000	4224851.000	4.000	2.000	0.000
Orlando	46,001.000	2134411.000	7.000	5.000	0.000
Philadelphia	59,240.000	5965343.000	4.000	1.000	1.000
Phoenix	44,102.000	4192887.000	7.000	9.000	1.000
Pittsburgh	52,961.000	2356285.000	5.000	1.000	0.000
Portland, Oregon	64,991.000	2226009.000	7.000	3.000	1.000
Puebla	14,543.000	1539819.000	3.000	3.000	0.000
Puerto Vallarta	14,987.000	255,681.000	11.000	20.000	0.000

Author's elaboration with data from the Census Bureau, SNIM and Bureau of Economic Analysis.

Table 12: Cities in the study. Descriptive statistics (Continued)

City	2014/2005 per capita GDP	2010 population	# of carriers that offer service	# of routes that include the city	Hub City
QueréTaro	16,057.000	801,940.000	3.000	4.000	0.000
Raleigh/Durham	52,890.000	1130490.000	4.000	1.000	0.000
Reno	42,625.000	425,417.000	2.000	1.000	0.000
Sacramento	46,012.000	2149127.000	5.000	3.000	0.000
Salt Lake City	59,558.000	1087873.000	5.000	5.000	1.000
San Antonio	41,109.000	2142508.000	6.000	5.000	0.000
San Diego	58,540.000	3095313.000	8.000	4.000	0.000
San Francisco	80,643.000	4335391.000	8.000	7.000	1.000
San Jose, California	105,482.000	1836911.000	6.000	2.000	0.000
San José Del Cabo	20,811.000	238,487.000	12.000	23.000	0.000
San Luis Potosí	16,758.000	772,604.000	3.000	3.000	0.000
Santa Ana	60,148.000	12800000.000	4.000	3.000	0.000
Seattle	75,874.000	3439809.000	8.000	3.000	1.000
St. Louis	48,885.000	2787701.000	4.000	4.000	0.000
Tampa	40,468.000	2783243.000	5.000	2.000	0.000
Tampico	14,645.000	297,554.000	3.000	1.000	0.000
Tijuana	16,148.000	1559683.000	2.000	1.000	1.000
Toluca	11,686.000	819,561.000	3.000	5.000	1.000
TorreóN	11,787.000	639,629.000	4.000	3.000	0.000
Uruapan	7,918.000	315,350.000	1.000	1.000	0.000
Veracruz	14,859.000	552,156.000	3.000	1.000	0.000
Villahermosa	10,655.000	640,359.000	3.000	1.000	0.000

Author's elaboration with data from the Census Bureau, SNIM and Bureau of Economic Analysis.

Table 12: Cities in the study. Descriptive statistics (Continued)

City	2014/2005 per capita GDP	2010 population	# of carriers that offer service	# of routes that include the city	Hub City
Washington	72,191.000	5636232.000	5.000	3.000	1.000
Zacatecas	13,574.000	138,176.000	4.000	3.000	0.000

Author's elaboration with data from the Census Bureau, SNIM and Bureau of Economic Analysis.

Table 13: Routes. Descriptive Statistics

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
Acapulco	Houston	0.286	1,531.768	3.000	3.000	9.000	1.000
Aguascalientes	Dallas-Fort Worth	0.396	1,345.124	3.000	4.000	9.000	0.000
Aguascalientes	Houston	0.415	1,153.653	2.000	4.000	9.000	0.000
Aguascalientes	Los Angeles	0.237	2,080.437	3.000	4.000	12.000	1.000
Atlanta	León/Del Bajío	0.342	2,186.631	3.000	6.000	6.000	0.000
Atlanta	CancúN	0.262	1,415.920	5.000	6.000	13.000	1.000
Atlanta	Cozumel	0.550	1,473.844	3.000	6.000	6.000	0.000
Atlanta	Guadalajara	0.309	2,363.621	3.000	6.000	7.000	0.000
Atlanta	Mexico City	0.254	2,139.970	4.000	6.000	10.000	1.000
Atlanta	Monterrey	0.409	1,745.765	3.000	6.000	7.000	0.000
Atlanta	Puerto Vallarta	0.278	2,505.213	5.000	6.000	11.000	1.000
Atlanta	San José Del Cabo	0.234	2,727.255	6.000	6.000	12.000	1.000
Austin	Cancún	0.269	1,481.889	2.000	2.000	13.000	1.000
Austin	Mexico City	0.314	1,200.314	2.000	2.000	10.000	1.000
Austin	Monterrey	1.080	545.451	1.000	2.000	7.000	0.000
Austin	San José Del Cabo	0.312	1,428.792	2.000	2.000	12.000	1.000
LeóN/Del BajíO	Atlanta	0.344	2,186.631	3.000	6.000	6.000	0.000
LeóN/Del BajíO	Dallas-Fort Worth	0.396	1,390.176	3.000	6.000	9.000	0.000
LeóN/Del BajíO	Houston	0.367	1,171.352	3.000	6.000	9.000	1.000
LeóN/Del BajíO	Los Angeles	0.209	2,197.894	4.000	6.000	12.000	1.000
LeóN/Del BajíO	Oakland	0.198	2,724.037	2.000	6.000	3.000	1.000
LeóN/Del BajíO	Chicago	0.249	2,657.010	2.000	6.000	8.000	0.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
LeóN/Del BajíO	San Francisco	0.204	2,728.864	2.000	6.000	8.000	0.000
Nashville	CancúN	0.292	1,671.751	4.000	4.000	13.000	1.000
Boston	CancúN	0.171	2,790.006	7.000	7.000	13.000	1.000
Boston	Mexico City	0.146	3,662.084	3.000	7.000	10.000	0.000
Baltimore	CancúN	0.190	2,233.292	5.000	5.000	13.000	1.000
Baltimore	San José Del Cabo	0.125	3,588.070	3.000	5.000	12.000	1.000
Cleveland	CancúN	0.181	2,307.306	5.000	5.000	13.000	1.000
Charlotte	CancúN	0.282	1,673.360	2.000	3.000	13.000	1.000
Charlotte	Cozumel	0.402	1,729.675	2.000	3.000	6.000	0.000
Charlotte	Mexico City	0.250	2,495.559	2.000	3.000	10.000	0.000
Charlotte	San José Del Cabo	0.210	3,086.062	3.000	3.000	12.000	1.000
Ciudad Del Carmen	Houston	0.339	1,304.899	3.000	3.000	9.000	1.000
Columbus, Ohio	CancúN	0.337	2,135.143	4.000	4.000	13.000	1.000
CancúN	Atlanta	0.272	1,415.920	5.000	13.000	6.000	1.000
CancúN	Austin	0.271	1,481.889	2.000	13.000	2.000	1.000
CancúN	Nashville	0.283	1,671.751	4.000	13.000	4.000	1.000
CancúN	Boston	0.172	2,790.006	6.000	13.000	7.000	1.000
CancúN	Buffalo	0.196	2,543.829	2.000	13.000	2.000	1.000
CancúN	Baltimore	0.174	2,233.292	4.000	13.000	5.000	1.000
CancúN	Cleveland	0.177	2,307.306	3.000	13.000	5.000	1.000
CancúN	Charlotte	0.236	1,673.360	2.000	13.000	3.000	1.000
CancúN	Columbus, Ohio	0.209	2,135.143	3.000	13.000	4.000	1.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
CancúN	Denver	0.142	2,685.421	5.000	13.000	6.000	1.000
CancúN	Dallas-Fort Worth	0.228	1,654.052	5.000	13.000	9.000	1.000
CancúN	Detroit	0.210	2,370.057	4.000	13.000	5.000	1.000
CancúN	Fort Lauderdale	0.437	883.341	5.000	13.000	5.000	1.000
CancúN	Washington	0.201	2,178.586	2.000	13.000	5.000	1.000
CancúN	Houston	0.224	1,304.899	3.000	13.000	9.000	1.000
CancúN	Indianapolis	0.230	2,070.783	4.000	13.000	5.000	1.000
CancúN	New York	0.175	2,500.386	6.000	13.000	11.000	1.000
CancúN	Las Vegas	0.157	3,211.564	7.000	13.000	10.000	1.000
CancúN	Los Angeles	0.136	3,409.471	9.000	13.000	12.000	1.000
CancúN	Kansas City	0.226	2,157.669	4.000	13.000	5.000	1.000
CancúN	Orlando	0.389	992.753	6.000	13.000	7.000	1.000
CancúN	Memphis	0.257	1,580.038	1.000	13.000	3.000	1.000
CancúN	Miami	0.713	854.379	3.000	13.000	5.000	1.000
CancúN	Milwaukee	0.195	2,429.590	4.000	13.000	5.000	1.000
CancúN	Minneapolis	0.171	2,706.338	6.000	13.000	7.000	1.000
CancúN	New Orleans	0.389	1,047.459	3.000	13.000	4.000	1.000
CancúN	Chicago	0.181	2,323.396	5.000	13.000	8.000	1.000
CancúN	Philadelphia	0.189	2,362.012	3.000	13.000	4.000	1.000
CancúN	Phoenix	0.165	2,831.840	5.000	13.000	7.000	1.000
CancúN	Pittsburgh	0.191	2,246.164	4.000	13.000	5.000	1.000
CancúN	Raleigh/Durham	0.247	1,822.997	3.000	13.000	4.000	1.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
CancúN	Fort Myers	0.430	801.282	3.000	13.000	3.000	1.000
CancúN	San Antonio	0.252	1,497.979	3.000	13.000	6.000	1.000
CancúN	Seattle	0.139	4,320.165	6.000	13.000	8.000	1.000
CancúN	San Francisco	0.152	3,872.863	4.000	13.000	8.000	1.000
CancúN	Salt Lake City	0.160	3,226.045	3.000	13.000	5.000	1.000
CancúN	St. Louis	0.183	1,990.333	3.000	13.000	4.000	1.000
CancúN	Tampa	0.427	884.950	4.000	13.000	5.000	1.000
Chihuahua	Denver	1.183	1,243.757	3.000	4.000	6.000	0.000
Chihuahua	Dallas-Fort Worth	0.555	971.836	3.000	4.000	9.000	0.000
Chihuahua	Houston	0.480	1,041.023	2.000	4.000	9.000	0.000
Cozumel	Atlanta	0.569	1,473.844	3.000	6.000	6.000	0.000
Cozumel	Charlotte	0.435	1,729.675	2.000	6.000	3.000	0.000
Cozumel	Denver	0.409	2,730.473	2.000	6.000	6.000	0.000
Cozumel	Dallas-Fort Worth	0.396	1,697.495	3.000	6.000	9.000	1.000
Cozumel	Detroit	0.375	2,427.981	2.000	6.000	5.000	0.000
Cozumel	Newark	0.269	2,542.220	1.000	6.000	3.000	0.000
Cozumel	Houston	0.378	1,346.733	3.000	6.000	9.000	1.000
Cozumel	Miami	0.849	894.604	4.000	6.000	5.000	1.000
Cozumel	Minneapolis	0.297	2,762.653	3.000	6.000	7.000	1.000
Cozumel	Chicago	0.293	2,379.711	3.000	6.000	8.000	0.000
Denver	CancúN	0.211	2,685.421	6.000	6.000	13.000	1.000
Denver	Chihuahua	0.967	1,243.757	3.000	6.000	4.000	0.000

Author’s elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
Denver	Cozumel	0.374	2,730.473	2.000	6.000	6.000	0.000
Denver	Guadalajara	0.345	2,148.015	3.000	6.000	7.000	1.000
Denver	Mexico City	0.285	2,326.614	4.000	6.000	10.000	1.000
Denver	Puerto Vallarta	0.265	2,127.098	4.000	6.000	11.000	1.000
Denver	San José Del Cabo	0.262	1,913.101	5.000	6.000	12.000	1.000
Denver	Ixtapa Zihuatanejo	0.265	2,485.905	1.000	6.000	8.000	0.000
Dallas-Fort Worth	Acapulco	0.270	1,815.150	2.000	9.000	3.000	1.000
Dallas-Fort Worth	Aguascalientes	0.381	1,345.124	3.000	9.000	4.000	0.000
Dallas-Fort Worth	LeóN/Del BajíO	0.386	1,390.176	3.000	9.000	6.000	0.000
Dallas-Fort Worth	CancúN	0.247	1,654.052	6.000	9.000	13.000	1.000
Dallas-Fort Worth	Chihuahua	0.539	971.836	3.000	9.000	4.000	0.000
Dallas-Fort Worth	Cozumel	0.378	1,697.495	3.000	9.000	6.000	1.000
Dallas-Fort Worth	Guadalajara	0.307	1,506.024	5.000	9.000	7.000	1.000
Dallas-Fort Worth	Mexico City	0.248	1,504.415	6.000	9.000	10.000	1.000
Dallas-Fort Worth	Morelia	0.359	1,497.979	3.000	9.000	4.000	0.000
Dallas-Fort Worth	Monterrey	0.581	843.116	3.000	9.000	7.000	0.000
Dallas-Fort Worth	MazatláN	0.388	1,407.875	4.000	9.000	8.000	1.000
Dallas-Fort Worth	Puebla	0.402	1,526.941	3.000	9.000	3.000	0.000
Dallas-Fort Worth	Puerto Vallarta	0.319	1,580.038	6.000	9.000	11.000	1.000
Dallas-Fort Worth	Querétaro	0.362	1,395.003	3.000	9.000	3.000	0.000
Dallas-Fort Worth	San José Del Cabo	0.295	1,647.616	6.000	9.000	12.000	1.000
Dallas-Fort Worth	San Luis Potosí	0.421	1,240.539	3.000	9.000	3.000	0.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
Dallas-Fort Worth	TorreóN	0.509	1,020.106	3.000	9.000	4.000	0.000
Dallas-Fort Worth	Zacatecas	0.520	1,238.930	3.000	9.000	4.000	0.000
Dallas-Fort Worth	Ixtapa Zihuatanejo	0.313	1,750.592	4.000	9.000	8.000	1.000
Durango	Houston	0.421	1,118.255	2.000	2.000	9.000	0.000
Durango	Los Angeles	0.337	1,731.284	2.000	2.000	12.000	0.000
Durango	Chicago	0.367	2,508.350	2.000	2.000	8.000	0.000
Detroit	CancúN	0.222	2,370.057	5.000	5.000	13.000	1.000
Detroit	Cozumel	0.340	2,427.981	2.000	5.000	6.000	0.000
Detroit	Mexico City	0.273	2,926.771	3.000	5.000	10.000	0.000
Detroit	Monterrey	0.354	2,381.320	3.000	5.000	7.000	0.000
Detroit	Puerto Vallarta	0.230	3,147.204	4.000	5.000	11.000	1.000
Detroit	San José Del Cabo	0.195	3,227.654	5.000	5.000	12.000	1.000
Newark	CancúN	0.195	2,487.514	1.000	3.000	13.000	1.000
Newark	Cozumel	0.255	2,542.220	1.000	3.000	6.000	0.000
Newark	Mexico City	0.155	3,340.284	1.000	3.000	10.000	0.000
Newark	Puerto Vallarta	0.139	3,679.783	1.000	3.000	11.000	0.000
Newark	San José Del Cabo	0.143	3,845.510	2.000	3.000	12.000	0.000
Fresno	Guadalajara	0.206	2,403.846	4.000	4.000	7.000	1.000
Fort Lauderdale	CancúN	0.401	883.341	5.000	5.000	13.000	1.000
Fort Lauderdale	Guadalajara	0.157	2,443.535	2.000	5.000	7.000	1.000
Fort Lauderdale	Mexico City	0.173	2,074.001	4.000	5.000	10.000	1.000
Fort Lauderdale	Toluca	0.468	2,126.659	1.000	5.000	3.000	0.000

Author’s elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
Guadalajara	Atlanta	0.315	2,363.621	3.000	7.000	6.000	0.000
Guadalajara	Denver	0.301	2,148.015	3.000	7.000	6.000	1.000
Guadalajara	Dallas-Fort Worth	0.330	1,506.024	4.000	7.000	9.000	1.000
Guadalajara	Fresno	0.188	2,403.846	4.000	7.000	4.000	1.000
Guadalajara	Fort Lauderdale	0.202	2,443.700	2.000	7.000	5.000	1.000
Guadalajara	Houston	0.347	1,319.380	3.000	7.000	9.000	1.000
Guadalajara	Indianapolis	0.296	2,675.767	2.000	7.000	5.000	0.000
Guadalajara	New York	0.145	3,574.662	3.000	7.000	11.000	1.000
Guadalajara	Las Vegas	0.228	2,074.001	4.000	7.000	10.000	1.000
Guadalajara	Los Angeles	0.188	2,102.963	6.000	7.000	12.000	1.000
Guadalajara	Orlando	0.213	2,390.974	3.000	7.000	7.000	1.000
Guadalajara	Memphis	0.429	2,072.392	2.000	7.000	3.000	0.000
Guadalajara	Oakland	0.188	2,638.760	2.000	7.000	3.000	1.000
Guadalajara	Ontario	0.231	2,056.302	4.000	7.000	4.000	1.000
Guadalajara	Chicago	0.189	2,785.179	4.000	7.000	8.000	1.000
Guadalajara	Portland, Oregon	0.150	3,292.014	3.000	7.000	7.000	1.000
Guadalajara	Phoenix	0.339	1,668.533	4.000	7.000	7.000	1.000
Guadalajara	Reno	0.136	2,625.888	2.000	7.000	2.000	1.000
Guadalajara	San Diego	0.262	1,929.191	3.000	7.000	8.000	1.000
Guadalajara	San Antonio	0.323	1,110.210	4.000	7.000	6.000	1.000
Guadalajara	Louisville, Kentucky	0.332	2,585.663	1.000	7.000	1.000	0.000
Guadalajara	San Francisco	0.210	2,641.978	3.000	7.000	8.000	0.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
Guadalajara	San Jose, California	0.165	2,593.708	5.000	7.000	6.000	1.000
Guadalajara	Salt Lake City	0.300	2,392.583	3.000	7.000	5.000	0.000
Guadalajara	Sacramento	0.188	2,670.940	4.000	7.000	5.000	1.000
Hermosillo	Los Angeles	1.196	881.732	2.000	3.000	12.000	0.000
Hermosillo	Phoenix	1.181	489.136	2.000	3.000	7.000	0.000
Huntsville	Mexico City	0.247	2,075.610	1.000	1.000	10.000	0.000
Huatulco	Houston	0.302	1,575.211	3.000	4.000	9.000	1.000
Huatulco	Minneapolis	0.335	3,238.917	2.000	4.000	7.000	0.000
Huatulco	St. Louis	0.411	2,609.798	2.000	4.000	4.000	0.000
Washington	Acapulco	0.203	3,277.533	2.000	5.000	3.000	0.000
Washington	CancúN	0.197	2,178.586	3.000	5.000	13.000	1.000
Washington	Mexico City	0.148	2,999.176	3.000	5.000	10.000	1.000
Washington	Morelia	0.219	3,099.640	1.000	5.000	4.000	0.000
Washington	San José Del Cabo	0.168	3,514.056	3.000	5.000	12.000	1.000
Houston	Acapulco	0.273	1,531.768	3.000	9.000	3.000	1.000
Houston	Aguascalientes	0.409	1,153.653	2.000	9.000	4.000	0.000
Houston	LeóN/Del BajíO	0.361	1,171.352	3.000	9.000	6.000	1.000
Houston	Ciudad Del Carmen	0.331	1,304.899	3.000	9.000	3.000	1.000
Houston	CancúN	0.236	1,304.899	4.000	9.000	13.000	1.000
Houston	Chihuahua	0.474	1,041.023	2.000	9.000	4.000	0.000
Houston	Cozumel	0.360	1,346.733	3.000	9.000	6.000	1.000
Houston	Durango	0.472	1,118.255	2.000	9.000	2.000	0.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
Houston	Guadalajara	0.309	1,319.380	4.000	9.000	7.000	1.000
Houston	Huatulco	0.294	1,575.211	3.000	9.000	4.000	1.000
Houston	Mexico City	0.239	1,227.667	4.000	9.000	10.000	1.000
Houston	MéRida	0.358	1,153.653	3.000	9.000	5.000	1.000
Houston	Morelia	0.376	1,259.847	2.000	9.000	4.000	0.000
Houston	Monterrey	0.515	661.299	4.000	9.000	7.000	1.000
Houston	Oaxaca	0.299	1,444.882	3.000	9.000	3.000	1.000
Houston	Puebla	0.391	1,237.321	2.000	9.000	3.000	0.000
Houston	Puerto Vallarta	0.258	1,433.619	3.000	9.000	11.000	1.000
Houston	QueréTaro	0.413	1,145.608	2.000	9.000	3.000	0.000
Houston	San José Del Cabo	0.220	1,618.654	5.000	9.000	12.000	1.000
Houston	San Luis Potosí	0.476	1,021.715	2.000	9.000	3.000	0.000
Houston	Tampico	0.466	888.168	3.000	9.000	3.000	1.000
Houston	Toluca	0.425	1,253.411	3.000	9.000	3.000	1.000
Houston	TorreóN	0.597	933.220	2.000	9.000	4.000	0.000
Houston	Veracruz	0.288	1,203.532	2.000	9.000	3.000	1.000
Houston	Villahermosa	0.315	1,351.560	3.000	9.000	3.000	1.000
Houston	Ixtapa Zihuatanejo	0.272	1,506.024	3.000	9.000	8.000	1.000
Houston	Manzanillo	0.360	1,518.896	2.000	9.000	5.000	0.000
Indianapolis	CancúN	0.252	2,070.783	5.000	5.000	13.000	1.000
New York	Acapulco	0.162	3,637.949	2.000	11.000	3.000	1.000
New York	CancúN	0.175	2,500.386	6.000	11.000	13.000	1.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
New York	Guadalajara	0.140	3,574.662	3.000	11.000	7.000	1.000
New York	Mexico City	0.141	3,362.810	4.000	11.000	10.000	1.000
New York	Morelia	0.219	3,465.010	1.000	11.000	4.000	0.000
New York	Monterrey	0.188	2,938.034	3.000	11.000	7.000	1.000
New York	Puerto Vallarta	0.142	3,707.136	4.000	11.000	11.000	1.000
New York	San José Del Cabo	0.136	3,874.472	4.000	11.000	12.000	1.000
New York	TorreóN	0.173	3,205.250	2.000	11.000	4.000	1.000
La Paz	Los Angeles	0.395	1,343.515	3.000	3.000	12.000	1.000
Las Vegas	Acapulco	0.258	2,631.590	1.000	10.000	3.000	0.000
Las Vegas	CancúN	0.137	3,211.564	7.000	10.000	13.000	1.000
Las Vegas	Guadalajara	0.222	2,074.001	4.000	10.000	7.000	1.000
Las Vegas	Mexico City	0.150	2,424.763	6.000	10.000	10.000	1.000
Las Vegas	Morelia	0.254	2,270.560	1.000	10.000	4.000	0.000
Las Vegas	Monterrey	0.291	1,832.651	5.000	10.000	7.000	1.000
Las Vegas	QueréTaro	0.244	2,252.440	1.000	10.000	3.000	0.000
Las Vegas	Toluca	0.275	2,402.237	2.000	10.000	3.000	1.000
Los Angeles	Aguascalientes	0.225	2,080.437	3.000	12.000	4.000	1.000
Los Angeles	LeóN/Del BajíO	0.208	2,197.894	4.000	12.000	6.000	1.000
Los Angeles	Ciudad ObregóN	0.440	1,095.960	2.000	12.000	2.000	1.000
Los Angeles	CancúN	0.130	3,409.471	10.000	12.000	13.000	1.000
Los Angeles	Durango	0.328	1,731.284	2.000	12.000	2.000	0.000
Los Angeles	Guadalajara	0.176	2,102.963	7.000	12.000	7.000	1.000

Author’s elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
Los Angeles	Hermosillo	0.407	881.732	2.000	12.000	3.000	0.000
Los Angeles	La Paz	0.382	1,343.515	3.000	12.000	3.000	1.000
Los Angeles	Loreto	0.338	1,113.428	1.000	12.000	1.000	0.000
Los Angeles	Mexico City	0.135	2,498.777	8.000	12.000	10.000	1.000
Los Angeles	Morelia	0.207	2,320.178	3.000	12.000	4.000	1.000
Los Angeles	Mexicali	1.958	328.420	1.000	12.000	2.000	0.000
Los Angeles	MazatláN	0.252	1,681.405	6.000	12.000	8.000	1.000
Los Angeles	Puerto Vallarta	0.230	1,959.762	7.000	12.000	11.000	1.000
Los Angeles	San José Del Cabo	0.277	1,465.799	7.000	12.000	12.000	1.000
Los Angeles	Uruapan	0.114	2,284.780	1.000	12.000	1.000	1.000
Los Angeles	Zacatecas	0.276	1,962.980	3.000	12.000	4.000	1.000
Los Angeles	Ixtapa Zihuatanejo	0.180	2,474.642	5.000	12.000	8.000	0.000
Los Angeles	Manzanillo	0.220	2,138.361	3.000	12.000	5.000	0.000
Loreto	Los Angeles	0.348	1,113.428	1.000	1.000	12.000	0.000
Kansas City	CancúN	0.220	2,157.669	5.000	5.000	13.000	1.000
Kansas City	Puerto Vallarta	0.215	2,296.043	3.000	5.000	11.000	1.000
Kansas City	San José Del Cabo	0.214	2,283.171	3.000	5.000	12.000	1.000
Orlando	CancúN	0.334	992.753	7.000	7.000	13.000	1.000
Orlando	Guadalajara	0.214	2,390.974	3.000	7.000	7.000	1.000
Orlando	Mexico City	0.152	2,061.129	6.000	7.000	10.000	1.000
Orlando	QueréTaro	0.366	2,094.300	1.000	7.000	3.000	0.000
Memphis	CancúN	0.339	1,580.038	2.000	3.000	13.000	1.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
Memphis	Guadalajara	0.426	2,072.392	2.000	3.000	7.000	0.000
Memphis	Monterrey	0.453	1,412.702	2.000	3.000	7.000	0.000
Memphis	Toluca	0.471	1,979.070	2.000	3.000	3.000	0.000
Mexico City	Atlanta	0.254	2,139.970	4.000	10.000	6.000	1.000
Mexico City	Austin	0.315	1,200.314	2.000	10.000	2.000	1.000
Mexico City	Boston	0.160	3,662.084	3.000	10.000	7.000	0.000
Mexico City	Charlotte	0.274	2,495.559	2.000	10.000	3.000	0.000
Mexico City	Denver	0.242	2,326.614	4.000	10.000	6.000	1.000
Mexico City	Dallas-Fort Worth	0.230	1,504.415	6.000	10.000	9.000	1.000
Mexico City	Detroit	0.270	2,926.771	3.000	10.000	5.000	0.000
Mexico City	Newark	0.155	3,340.284	1.000	10.000	3.000	0.000
Mexico City	Fort Lauderdale	0.161	2,074.001	4.000	10.000	5.000	1.000
Mexico City	Huntsville	0.288	2,075.610	1.000	10.000	1.000	0.000
Mexico City	Washington	0.160	2,999.176	3.000	10.000	5.000	1.000
Mexico City	Houston	0.232	1,227.667	5.000	10.000	9.000	1.000
Mexico City	New York	0.144	3,362.810	4.000	10.000	11.000	1.000
Mexico City	Las Vegas	0.152	2,424.763	6.000	10.000	10.000	1.000
Mexico City	Los Angeles	0.137	2,498.777	8.000	10.000	12.000	1.000
Mexico City	Orlando	0.145	2,061.129	6.000	10.000	7.000	1.000
Mexico City	Mcallen	0.695	751.403	2.000	10.000	2.000	0.000
Mexico City	Miami	0.166	2,053.084	5.000	10.000	5.000	1.000
Mexico City	Oakland	0.155	3,021.702	3.000	10.000	3.000	1.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
Mexico City	Ontario	0.188	2,445.680	4.000	10.000	4.000	1.000
Mexico City	Chicago	0.191	2,712.774	5.000	10.000	8.000	1.000
Mexico City	Phoenix	0.240	2,012.859	5.000	10.000	7.000	1.000
Mexico City	San Diego	0.181	2,328.223	4.000	10.000	8.000	1.000
Mexico City	San Antonio	0.309	1,119.864	6.000	10.000	6.000	1.000
Mexico City	Louisville, Kentucky	0.251	2,444.071	1.000	10.000	1.000	0.000
Mexico City	San Francisco	0.156	3,026.529	4.000	10.000	8.000	1.000
Mexico City	Salt Lake City	0.244	2,666.113	3.000	10.000	5.000	0.000
Mexico City	Sacramento	0.136	3,042.619	5.000	10.000	5.000	1.000
Mexico City	Santa Ana	0.171	2,440.853	2.000	10.000	4.000	1.000
Mexico City	St. Louis	0.262	2,304.880	3.000	10.000	4.000	1.000
Mexico City	Tampa	0.263	1,930.800	3.000	10.000	5.000	1.000
Mcallen	Mexico City	0.691	752.807	2.000	2.000	10.000	0.000
Miami	Acapulco	0.218	2,249.180	2.000	5.000	3.000	1.000
Miami	CancúN	0.598	854.379	4.000	5.000	13.000	1.000
Miami	Cozumel	0.810	894.604	4.000	5.000	6.000	1.000
Miami	Guadalajara	0.175	2,421.620	2.000	5.000	7.000	1.000
Miami	Mexico City	0.166	2,053.084	5.000	5.000	10.000	1.000
Miami	MéRida	0.338	1,097.338	4.000	5.000	5.000	1.000
Miami	Monterrey	0.212	1,985.506	5.000	5.000	7.000	1.000
Miami	Puebla	0.366	1,996.300	1.000	5.000	3.000	0.000
MéRida	Fort Lauderdale	0.419	1,124.691	2.000	5.000	5.000	1.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
MéRida	Houston	0.368	1,153.651	3.000	5.000	9.000	1.000
MéRida	Orlando	0.373	1,184.730	3.000	5.000	7.000	1.000
MéRida	Miami	0.339	1,097.338	4.000	5.000	5.000	1.000
Milwaukee	CancúN	0.224	2,429.590	5.000	5.000	13.000	1.000
Milwaukee	Puerto Vallarta	0.157	2,952.515	3.000	5.000	11.000	1.000
Morelia	Dallas-Fort Worth	0.365	1,497.979	3.000	4.000	9.000	0.000
Morelia	Houston	0.386	1,259.847	2.000	4.000	9.000	0.000
Morelia	Los Angeles	0.213	2,320.178	3.000	4.000	12.000	1.000
Morelia	Oakland	0.239	2,851.148	2.000	4.000	3.000	1.000
Morelia	Chicago	0.228	2,746.563	2.000	4.000	8.000	0.000
Morelia	San Francisco	0.227	2,854.366	2.000	4.000	8.000	0.000
Minneapolis	CancúN	0.193	2,706.338	7.000	7.000	13.000	1.000
Minneapolis	Cozumel	0.280	2,762.653	4.000	7.000	6.000	1.000
Minneapolis	Huatulco	0.293	3,238.917	3.000	7.000	4.000	1.000
Minneapolis	MazatláN	0.316	2,685.421	4.000	7.000	8.000	1.000
Minneapolis	Puerto Vallarta	0.203	2,902.636	6.000	7.000	11.000	1.000
Minneapolis	San José Del Cabo	0.224	2,838.276	6.000	7.000	12.000	1.000
Minneapolis	Ixtapa Zihuatanejo	0.211	3,119.851	4.000	7.000	8.000	1.000
Minneapolis	Manzanillo	0.226	3,041.010	4.000	7.000	5.000	1.000
New Orleans	CancúN	0.704	1,047.459	4.000	4.000	13.000	1.000
Monterrey	Atlanta	0.413	1,745.765	3.000	7.000	6.000	0.000
Monterrey	Austin	1.080	545.451	1.000	7.000	2.000	0.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
Monterrey	Baltimore	0.238	2,642.700	2.000	7.000	5.000	0.000
Monterrey	Dallas-Fort Worth	0.563	843.116	3.000	7.000	9.000	0.000
Monterrey	Detroit	0.338	2,381.320	3.000	7.000	5.000	0.000
Monterrey	Houston	0.509	661.299	5.000	7.000	9.000	1.000
Monterrey	New York	0.192	2,938.034	3.000	7.000	11.000	1.000
Monterrey	Las Vegas	0.284	1,832.651	5.000	7.000	10.000	1.000
Monterrey	Orlando	0.268	1,884.139	3.000	7.000	7.000	1.000
Monterrey	Memphis	0.472	1,412.702	2.000	7.000	3.000	0.000
Monterrey	Miami	0.213	1,985.506	5.000	7.000	5.000	1.000
Monterrey	Chicago	0.243	2,115.835	3.000	7.000	8.000	1.000
Monterrey	San Antonio	0.866	445.693	4.000	7.000	6.000	1.000
Mexicali	Los Angeles	2.029	328.420	2.000	2.000	12.000	0.000
MazatláN	Dallas-Fort Worth	0.473	1,407.875	3.000	8.000	9.000	0.000
MazatláN	Los Angeles	0.253	1,681.405	6.000	8.000	12.000	1.000
MazatláN	Minneapolis	0.285	2,685.421	4.000	8.000	7.000	1.000
MazatláN	Phoenix	0.568	1,269.501	3.000	8.000	7.000	0.000
Oakland	LeóN/Del BajíO	0.187	2,724.037	2.000	3.000	6.000	1.000
Oakland	Guadalajara	0.178	2,638.760	2.000	3.000	7.000	1.000
Oakland	Mexico City	0.149	3,021.702	3.000	3.000	10.000	1.000
Oakland	Morelia	0.326	2,851.148	2.000	3.000	4.000	0.000
Oakland	Tijuana	0.804	748.185	2.000	3.000	2.000	1.000
Oaxaca	Houston	0.308	1,444.882	3.000	3.000	9.000	1.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
Ontario	Guadalajara	0.221	2,056.302	4.000	4.000	7.000	1.000
Ontario	Mexico City	0.185	2,445.680	4.000	4.000	10.000	1.000
Chicago	LeóN/Del BajíO	0.231	2,657.010	1.000	8.000	6.000	0.000
Chicago	CancúN	0.188	2,323.396	5.000	8.000	13.000	1.000
Chicago	Cozumel	0.303	2,379.711	2.000	8.000	6.000	0.000
Chicago	Durango	0.363	2,508.350	1.000	8.000	2.000	0.000
Chicago	Guadalajara	0.181	2,785.179	4.000	8.000	7.000	1.000
Chicago	Mexico City	0.181	2,712.774	5.000	8.000	10.000	1.000
Chicago	Morelia	0.231	2,746.563	1.000	8.000	4.000	0.000
Chicago	Monterrey	0.173	2,115.835	2.000	8.000	7.000	1.000
Chicago	Puerto Vallarta	0.179	2,868.847	3.000	8.000	11.000	1.000
Chicago	San José Del Cabo	0.195	2,907.463	3.000	8.000	12.000	1.000
Chicago	Zacatecas	0.370	2,526.470	1.000	8.000	4.000	0.000
Chicago	Ixtapa Zihuatanejo	0.260	2,994.349	1.000	8.000	8.000	0.000
Puebla	Dallas-Fort Worth	0.434	1,526.941	3.000	3.000	9.000	0.000
Puebla	Houston	0.406	1,237.321	2.000	3.000	9.000	0.000
Portland, Oregon	Guadalajara	0.142	3,292.014	3.000	7.000	7.000	1.000
Portland, Oregon	Puerto Vallarta	0.204	3,185.820	6.000	7.000	11.000	1.000
Portland, Oregon	San José Del Cabo	0.183	2,748.172	6.000	7.000	12.000	1.000
Philadelphia	CancúN	0.239	2,362.012	4.000	4.000	13.000	1.000
Phoenix	CancúN	0.182	2,831.840	6.000	7.000	13.000	1.000
Phoenix	Guadalajara	0.342	1,668.533	4.000	7.000	7.000	1.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
Phoenix	Hermosillo	1.251	489.136	2.000	7.000	3.000	0.000
Phoenix	Mexico City	0.255	2,012.859	5.000	7.000	10.000	1.000
Phoenix	MazatláN	0.587	1,269.501	3.000	7.000	8.000	0.000
Phoenix	Puerto Vallarta	0.387	1,562.339	4.000	7.000	11.000	1.000
Phoenix	San José Del Cabo	0.462	1,161.698	4.000	7.000	12.000	1.000
Phoenix	Ixtapa Zihuatanejo	0.380	2,046.648	3.000	7.000	8.000	0.000
Phoenix	Manzanillo	0.384	1,747.374	2.000	7.000	5.000	0.000
Pittsburgh	CancúN	0.191	2,246.164	5.000	5.000	13.000	1.000
Puerto Vallarta	Atlanta	0.270	2,505.213	5.000	11.000	6.000	1.000
Puerto Vallarta	Denver	0.262	2,127.098	4.000	11.000	6.000	1.000
Puerto Vallarta	Dallas-Fort Worth	0.304	1,580.038	5.000	11.000	9.000	1.000
Puerto Vallarta	Detroit	0.223	3,147.204	4.000	11.000	5.000	1.000
Puerto Vallarta	Newark	0.146	3,679.783	1.000	11.000	3.000	0.000
Puerto Vallarta	Houston	0.267	1,433.619	3.000	11.000	9.000	1.000
Puerto Vallarta	New York	0.151	3,707.136	4.000	11.000	11.000	1.000
Puerto Vallarta	Los Angeles	0.223	1,959.762	7.000	11.000	12.000	1.000
Puerto Vallarta	Kansas City	0.217	2,296.043	3.000	11.000	5.000	1.000
Puerto Vallarta	Milwaukee	0.146	2,952.515	3.000	11.000	5.000	1.000
Puerto Vallarta	Minneapolis	0.196	2,902.636	6.000	11.000	7.000	1.000
Puerto Vallarta	Chicago	0.183	2,868.847	4.000	11.000	8.000	1.000
Puerto Vallarta	Portland, Oregon	0.202	3,185.820	6.000	11.000	7.000	1.000
Puerto Vallarta	Phoenix	0.351	1,562.339	4.000	11.000	7.000	1.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
Puerto Vallarta	San Diego	0.387	1,784.381	4.000	11.000	8.000	1.000
Puerto Vallarta	Seattle	0.174	3,343.502	6.000	11.000	8.000	1.000
Puerto Vallarta	San Francisco	0.199	2,500.386	6.000	11.000	8.000	1.000
Puerto Vallarta	Salt Lake City	0.244	2,318.569	5.000	11.000	5.000	1.000
Puerto Vallarta	Santa Ana	0.313	1,903.447	4.000	11.000	4.000	1.000
Puerto Vallarta	St. Louis	0.197	2,458.552	3.000	11.000	4.000	1.000
QueréTaro	Dallas-Fort Worth	0.361	1,395.003	3.000	3.000	9.000	0.000
QueréTaro	Houston	0.421	1,145.608	2.000	3.000	9.000	0.000
Raleigh/Durham	CancúN	0.273	1,822.997	4.000	4.000	13.000	1.000
Reno	Guadalajara	0.135	2,625.888	2.000	2.000	7.000	1.000
Fort Myers	CancúN	0.433	801.282	3.000	3.000	13.000	1.000
San Diego	Guadalajara	0.278	1,929.191	3.000	8.000	7.000	1.000
San Diego	La Paz	0.771	1,171.170	1.000	8.000	3.000	0.000
San Diego	Mexico City	0.176	2,328.223	4.000	8.000	10.000	1.000
San Diego	Puerto Vallarta	0.341	1,784.381	4.000	8.000	11.000	1.000
San Diego	San José Del Cabo	0.266	1,290.418	5.000	8.000	12.000	1.000
San Antonio	CancúN	0.235	1,497.979	4.000	6.000	13.000	1.000
San Antonio	Guadalajara	0.321	1,110.210	4.000	6.000	7.000	1.000
San Antonio	Mexico City	0.288	1,119.864	6.000	6.000	10.000	1.000
San Antonio	Monterrey	0.867	445.693	4.000	6.000	7.000	1.000
San Antonio	Nuevo Laredo	2.314	256.050	1.000	6.000	1.000	0.000
San Antonio	San Luis Potosí	0.526	843.116	1.000	6.000	3.000	0.000

Author’s elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
San Antonio	Toluca	0.555	1,134.345	2.000	6.000	3.000	0.000
Louisville, Kentucky	Guadalajara	0.316	2,585.663	1.000	1.000	7.000	0.000
Louisville, Kentucky	Mexico City	0.225	2,444.071	1.000	1.000	10.000	0.000
Seattle	CancúN	0.151	4,320.165	7.000	8.000	13.000	1.000
Seattle	Puerto Vallarta	0.169	3,343.502	6.000	8.000	11.000	1.000
Seattle	San José Del Cabo	0.173	2,920.335	6.000	8.000	12.000	1.000
San Francisco	Acapulco	0.190	3,205.080	1.000	8.000	3.000	0.000
San Francisco	Aguascalientes	0.297	2,613.200	1.000	8.000	4.000	0.000
San Francisco	LeóN/Del BajíO	0.186	2,728.864	2.000	8.000	6.000	0.000
San Francisco	CancúN	0.146	3,872.863	6.000	8.000	13.000	1.000
San Francisco	Guadalajara	0.234	2,641.978	3.000	8.000	7.000	0.000
San Francisco	Mexico City	0.158	3,026.529	4.000	8.000	10.000	1.000
San Francisco	Morelia	0.220	2,854.366	2.000	8.000	4.000	0.000
San Francisco	MazatláN	0.410	2,222.940	1.000	8.000	8.000	0.000
San Francisco	Puerto Vallarta	0.197	2,500.386	6.000	8.000	11.000	1.000
San Francisco	San José Del Cabo	0.234	2,008.032	6.000	8.000	12.000	1.000
San Jose, California	Guadalajara	0.156	2,593.708	4.000	6.000	7.000	1.000
San Jose, California	San José Del Cabo	0.346	1,961.371	3.000	6.000	12.000	0.000
San José Del Cabo	Atlanta	0.227	2,727.255	6.000	12.000	6.000	1.000
San José Del Cabo	Austin	0.322	1,428.792	2.000	12.000	2.000	1.000
San José Del Cabo	Baltimore	0.139	3,588.070	3.000	12.000	5.000	1.000
San José Del Cabo	Charlotte	0.226	3,086.062	3.000	12.000	3.000	1.000

Author’s elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
San José Del Cabo	Denver	0.246	1,913.101	5.000	12.000	6.000	1.000
San José Del Cabo	Dallas-Fort Worth	0.288	1,647.616	4.000	12.000	9.000	1.000
San José Del Cabo	Detroit	0.186	3,227.654	5.000	12.000	5.000	1.000
San José Del Cabo	Newark	0.148	3,845.510	2.000	12.000	3.000	0.000
San José Del Cabo	Washington	0.187	3,514.056	3.000	12.000	5.000	1.000
San José Del Cabo	Houston	0.240	1,618.654	5.000	12.000	9.000	1.000
San José Del Cabo	New York	0.141	3,874.472	4.000	12.000	11.000	1.000
San José Del Cabo	Los Angeles	0.273	1,465.799	6.000	12.000	12.000	1.000
San José Del Cabo	Laredo	0.624	1,140.781	1.000	12.000	1.000	0.000
San José Del Cabo	Kansas City	0.225	2,283.171	3.000	12.000	5.000	1.000
San José Del Cabo	Minneapolis	0.215	2,838.276	6.000	12.000	7.000	1.000
San José Del Cabo	Chicago	0.189	2,907.463	4.000	12.000	8.000	1.000
San José Del Cabo	Portland, Oregon	0.198	2,748.172	6.000	12.000	7.000	1.000
San José Del Cabo	Phoenix	0.472	1,161.698	4.000	12.000	7.000	1.000
San José Del Cabo	San Diego	0.253	1,290.418	5.000	12.000	8.000	1.000
San José Del Cabo	Seattle	0.177	2,920.335	6.000	12.000	8.000	1.000
San José Del Cabo	San Francisco	0.241	2,008.032	6.000	12.000	8.000	1.000
San José Del Cabo	San Jose, California	0.332	1,961.371	4.000	12.000	6.000	1.000
San José Del Cabo	Salt Lake City	0.284	1,966.198	4.000	12.000	5.000	1.000
San José Del Cabo	Santa Ana	0.300	1,411.093	3.000	12.000	4.000	1.000
Salt Lake City	CancúN	0.181	3,226.045	5.000	5.000	13.000	1.000
Salt Lake City	Guadalajara	0.307	2,392.583	3.000	5.000	7.000	0.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
Salt Lake City	Mexico City	0.256	2,666.113	3.000	5.000	10.000	0.000
Salt Lake City	Puerto Vallarta	0.265	2,318.569	5.000	5.000	11.000	1.000
Salt Lake City	San José Del Cabo	0.280	1,966.198	4.000	5.000	12.000	1.000
San Luis Potosí	Dallas-Fort Worth	0.427	1,240.539	3.000	3.000	9.000	0.000
San Luis Potosíí	Houston	0.554	1,021.715	2.000	3.000	9.000	0.000
Sacramento	Acapulco	0.198	3,233.130	1.000	5.000	3.000	0.000
Sacramento	Guadalajara	0.164	2,670.940	4.000	5.000	7.000	1.000
Sacramento	Mexico City	0.139	3,042.619	5.000	5.000	10.000	1.000
Santa Ana	Mexico City	0.168	2,440.853	2.000	4.000	10.000	1.000
Santa Ana	Puerto Vallarta	0.327	1,903.447	4.000	4.000	11.000	1.000
Santa Ana	San José Del Cabo	0.277	1,411.093	3.000	4.000	12.000	1.000
St. Louis	CancúN	0.197	1,990.333	4.000	4.000	13.000	1.000
St. Louis	Huatulco	0.448	2,609.798	2.000	4.000	4.000	0.000
St. Louis	Puerto Vallarta	0.226	2,458.552	4.000	4.000	11.000	1.000
Tampico	Houston	0.458	888.168	3.000	3.000	9.000	1.000
Tijuana	Los Angeles	2.495	205.952	2.000	2.000	12.000	1.000
Tijuana	Oakland	1.297	748.185	1.000	2.000	3.000	0.000
Tijuana	Sacramento	0.367	801.410	1.000	2.000	5.000	1.000
Toluca	Fort Lauderdale	0.490	2,126.562	1.000	3.000	5.000	0.000
Toluca	Houston	0.424	1,253.411	3.000	3.000	9.000	1.000
Toluca	Las Vegas	0.293	2,402.237	2.000	3.000	10.000	1.000
Toluca	Memphis	0.460	1,979.070	2.000	3.000	3.000	0.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

Table 13: Cities and routes (Continued)

Origin	Destination	Price per km	Distance	Carriers in the route	Carriers in origin	Carriers in destination	LCC route
Toluca	San Antonio	0.557	1,134.345	2.000	3.000	6.000	0.000
Tampa	CancúN	0.426	884.950	5.000	5.000	13.000	1.000
TorreóN	Dallas-Fort Worth	0.510	1,020.106	3.000	4.000	9.000	0.000
TorreóóN	Houston	0.646	933.220	2.000	4.000	9.000	0.000
Uruapan	Los Angeles	0.132	2,284.780	1.000	1.000	12.000	1.000
Veracruz	Brownsville	1.044	759.448	1.000	3.000	1.000	0.000
Veracruz	Houston	0.300	1,203.532	2.000	3.000	9.000	1.000
Villahermosa	Houston	0.315	1,351.560	3.000	3.000	9.000	1.000
Zacatecas	Dallas-Fort Worth	0.560	1,238.930	3.000	4.000	9.000	0.000
Zacatecas	Los Angeles	0.276	1,962.980	3.000	4.000	12.000	1.000
Zacatecas	Chicago	0.318	2,526.470	2.000	4.000	8.000	0.000
Ixtapa Zihuatanejo	Denver	0.259	2,485.905	1.000	8.000	6.000	0.000
Ixtapa Zihuatanejo	Dallas-Fort Worth	0.340	1,750.592	3.000	8.000	9.000	0.000
Ixtapa Zihuatanejo	Houston	0.282	1,506.024	3.000	8.000	9.000	1.000
Ixtapa Zihuatanejo	Los Angeles	0.187	2,474.642	4.000	8.000	12.000	0.000
Ixtapa Zihuatanejo	Minneapolis	0.214	3,119.851	4.000	8.000	7.000	1.000
Ixtapa Zihuatanejo	Chicago	0.254	2,994.349	2.000	8.000	8.000	0.000
Ixtapa Zihuatanejo	Phoenix	0.346	2,046.648	3.000	8.000	7.000	0.000
Manzanillo	Houston	0.365	1,518.896	2.000	5.000	9.000	0.000
Manzanillo	Los Angeles	0.222	2,138.361	3.000	5.000	12.000	0.000
Manzanillo	Minneapolis	0.220	3,041.010	4.000	5.000	7.000	1.000
Manzanillo	Phoenix	0.378	1,747.374	2.000	5.000	7.000	0.000

Author's elaboration with data from the DOT and www.world-airport-codes.com. Prices in dollars.

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