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TEMPORAL CHANGES OF AIRFARES TOWARD FIXED DEPARTURE DATE

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ABSTRACT. Despite the existence of numerous published articles that examined the online fares for air-tickets, no prior studies have investigated the issue of temporal changes of airfares toward a fixed departure date. In other words, consumers have no knowledge of when the best time is to purchase their lowest fared air-tickets from the Internet. This study investigated the daily changes of fares for return air-tickets on five online travel agency (OTA) websites with fixed dates of departure during shoulder and high seasons. Empirical findings showed the lowest airfares from Hong Kong to Beijing and Bangkok, representing two most popular short-haul travel destinations, were not found at the initial stage of the data collection period. In other words, consumers should not make online purchase of air-tickets too early.

KEYWORDS. Airfares, temporal changes, shoulder season, high season, travel website

INTRODUCTION

The present hospitality and tourism industries have been taking advantage of the global reach of the Internet to distribute their products (Gilbert, Beveridge, & Lee-Kelly, 2005; O'Connor & Frew, 2002; O'Connor & Murphy, 2008). Other than benefits, Christodoulidou, Brewer, Feibstein, and Bai (2007) stated that distributing on the Internet does have many challenges. In air travel, although airlines have been attempting to move consumers to purchase air-tickets from other channels to their own websites (Lubbe, 2007), airfare sales are still dominated by the large online travel agencies (OTAs). In an earlier study and based on 2000 consumers' views, OTAs were found to outperform airline websites (McGann, 2005). As one of the largest OTAs in the world, Expedia (2008) stated that the revenue of worldwide air travel increased 14% in the second quarter of 2008. Eyefortravel (2008) further stated that booking air travel is like a comparison of online shopping, in which 62% of online air shoppers searched on Expedia sites, and nearly 40% of consumers never visited a supplier's website.

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As such, airlines are currently making OTAs a priority for reaching consumers.

Among different transportation modes, air travel remains very popular due to the speed of modern aircraft. Air travelers can save their time on traveling during their trips. Golob and Hensher (2007) found the behavior of shifting from private vehicles to public transport such as aircraft is especially true for senior travelers. The popularity of air travel has thus attracted researchers to examine different factors that influence consumers' preference of airlines. For instance, Pels, Nijkamp, and Rietveld (2001) presented a logit model that captures passenger preferences of airports and airlines. Similarly, Suzuki (2007) examined the selection of airport and airline preferences, and argued that a two-step choice model—including the satisfaction of minimum acceptable standards and then the utility maximization—is better than the traditional one-step approach. Likewise, Proussaloglou and Koppelman (1995) developed a framework that models demand for an air carrier, which in turn, can determine the carrier's market share. In another study, Nako (1992) analyzed the effect of frequent flyer programs, and found the programs did have a significant effect on airline choice. Likewise, Graham, Garrow, and Leonard (2010) found, compared to leisure travelers, business travelers often make changes to their airline itineraries. Moreover, consumers are presently more accustomed to purchase air-tickets online. Bigne, Hernandez, Ruiz, and Andreu (2010) thus analyzed the motivation, opportunity, and ability that affect consumers' purchase intention.

Travel can generally be grouped into short-haul and long-haul categories (Mason 2006). Mason (2006) found 30% of short-haul travelers do normally change their schedules with the ticket flexibility offered by airlines. Palmer and Boissy (2009), based on their findings, stated that more than 75% of short-haul travelers choose air-tickets with the lowest fares. In contrast, Brons, Pels, Nijkamp, and Rietveld (2002) stated that long-haul flights are normally less affected by substitutes as compared to short-haul flights, and that business travel is less sensitive to airfare change as leisure travel is considered as a discretionary expenditure. In other words, travelers of long-haul flights are less sensitive to price. These effects, together with the ease to find alternative travel means (e.g., train and coach), render the importance of investigating the pricing practice of short-haul flights.

Since consumers can make purchases anytime during a year and that potential consumers of short-haul flights tend to be more price sensitive, it would be useful if studies on ongoing price variations are conducted over a time period. Malighetti, Palerari, and Redondi (2010) attempted to examine the price variation over time but their study was based on a single airline, which offers limited, if any, useful information for consumers. As well, different published articles did examine changes of hotel room rates based on multiple websites but their studies are unrelated to air travel (Law, Chan, & Goh, 2007; Gazzoli, Kim, & Palakurthi, 2008; Tso & Law, 2005). In a recently conducted study, Law, Denizci Guillet, and Leung (2010) examined the continuous changes of airfares but the scope of the study was to analyze variations for future airfares for a preset day in the past. These counting ahead studies, albeit could be of use to the consumers who are flexible in departure, do not benefit the travelers who are not flexible on a departure date. An example of these inflexible travelers is those who travel during summer holidays or Christmas, which are always in high demand of air travel. To date, published articles in the tourism literature have rarely, if ever any, tried to examine temporal changes of airfares as it approaches to a fixed departure date. Such an absence of prior studies is particularly true for peak and shoulder seasons, during which airfares are always at their highest as the demand for travel is often large.

In view of the absence of published articles in the existing tourism literature that examined the variation of prices for a fixed departure date, this exploratory study makes an initial attempt to investigate the issue by analyzing the temporal changes of lowest airfares on major OTAs. Findings are expected to make a meaningful contribution to the tourism industry for consumers, practitioners, and researchers to better understand when the best time is to make online purchase of airfares from OTAs for a fixed

departure date during peak and shoulder seasons. In other words, the primary objective of this study is to answer the research question of "When is the best time to buy the lowest priced air-tickets from OTAs for a fixed departure date in high demand for air travel?". Another objective of this study is to find out "When is the best time to buy the lowest priced air-tickets for flights with the shortest duration?".

Having introduced the research motivations in this section, the remaining parts of this article are organized as follows. First, there is a literature review section that overviews published articles that pertain to OTAs and the issues of airfares and travel duration. A section on methodology then follows, which describes the process of data collection and organization. After that, there is a section on findings and analysis. A section on discussion of the findings and industrial implications is then followed. The last section concludes the study and offers suggestions for future research.

LITERATURE REVIEW

Online Travel Agencies

Since its introduction to travel and tourism, the Internet has gained its popularity as a primary tool for travel planning and more importantly for online bookings. According to Eyefortravel (2010c), 45% of all hotel reservations were made online in 2010, compared to less than 15% via travel agents. Among the available channels, OTAs acquired a large share of 33% bookings for the top 30 hotel brands. Financially, commissions from hotels to OTAs in 2010 reached US$5.4 billion. Eyefortravel (2011) further states that OTAs are a valuable channel for marketing and third-party distribution channel for tourism suppliers. Specifically, OTAs are mainly used by budget-conscious consumers; whereas hotel websites are primarily for more frequent and high spending consumers. According to PhoCusWright, the economy of scale that OTAs operate renders, the total gross bookings grew 27% in the first 6 months in 2010 over the same period in 2009 (Kapoor & Quinby, 2010), and that revenue from airline passengers was higher than hotel room revenue and car rental revenue. Law et al. (2010) argued that airlines need to largely rely on OTAs for distributing their products to existing and new customers. Similarly, Alamdari (2002) stated that airlines utilize many channels to sell their tickets, and one of the major distribution channels is OTAs.

The success of OTAs is attributed to different reasons. In his early article, Buhalis (1998) already predicted that Internet-based travel agents, still at their early business stage then, would become a key tourism player. Such a prediction was made on the basis of cost drivers like low distribution and labor cost and market drivers like flexibility in time of operation and provision of last minute deals. Buhalis and Licata (2002) subsequently verified the perceived advantages of online distribution for travel products from tourism professionals one decade ago. Drawing on their findings, Buhalis and Licata (2002) then advocated the potential disintermediation of the traditional travel agents. Law (2009), however, stated that tourism suppliers could remain competitive if they market their products appropriately on different channels. With the ongoing cooperation with different business partners, tourism suppliers as well as traditional agents should take advantage of the efficiency of the Internet to gain a stable business return. Buhalis and Law (2008) advocated that consumers should widely use OTAs due to their transparent pricing system, which in turn, may lead to eventual price parity.

There are different problems for using OTAs. For instance, Buhalis and Law (2008) as well as Tso and Law (2005) stated that the Internet has brought around too many choices to potential consumers, rendering their difficulty during the decision-making process. In another study, Bazaz, Green, and Green (2010) found 67% of the included OTAs do not have information on health advice. Likewise, Denizci Guillet and Law (2010) found many hotels in Hong Kong have different star ratings among the 11 OTAs. Albeit this was likely due to the complexity in managing different online distribution channels, such a discrepancy can cause potential confusion to consumers.

Air Travel and Airfares

It is generally agreed that the demand for air transport is predominately determined by consumers' propensity to spend (Brons et al., 2002). Additionally, price has always been one of the most important factors in a decision-making process for consumers to purchase air-tickets (Proussaloglou & Koppelman, 1999; Vowles, 2000), in general and particularly for leisure travelers (Malighetti, Palerari, & Redondi, 2009). Leisure travelers primarily aim to maximize their satisfaction that is derived from air travel, subject to their budget constraints (Alderighi, 2010). Brons et al. (2002) argued that airfare data can serve well as a proxy for travel motives. As such, pricing practices have drawn the attention of many researchers. In his study, Bilotkach (2010) found airlines choose not to distribute their tickets via a channel where consumers can observe competitors' offers. This is to potentially take advantage of consumers' incomplete information source. Chi and Koo (2009) examined the pricing behavior of U.S. airlines in the domestic market, and found differential pricing strategies were adopted by the included airlines. The practice of airlines to adopt dynamic pricing is confirmed by Mantin and Koo (2009). The behavior of airlines to employ different pricing strategies was further confirmed by Bilotkach, Gorodnichenko, and Talavera (2010). Chernev (2003), however, showed consumers often prefer to select rather than generate during online purchase, implying the failure of the opaque model—one of the three major price models adopted by OTAs, as adopted by auction travel websites. According to Law et al. (2007), other pricing models that are commonly used by OTAs are merchant models and commissionable models. While suppliers assign their products to OTAs which subsequently mark up the price and then sell the products in a merchant model, suppliers pay OTAs commission fees for product selling.

Furthermore, Seetaram (2010) identified the potential errors in data when elasticities of airfares are calculated, and then presented an approach to compute airfare elasticities on tourism demand. In another study, Obeng (2008) analyzed the variation of airfares by using a conceptual model of fares offered on the Internet. Empirical evidence showed airfare differentiation existed in the travel market. Chen, Peng, and Hackley (2008), however, argued that service quality can be as important as fares when students purchase long-haul air-tickets.

In their study, Gillen and Mantin (2009) examined the price vitality of airfares for the U.S. domestic market using airfares collected from Farecast.com for departing on November 7, 2007. Experimental findings showed the volatility remained stable up to 2 weeks prior to the flight. The study, however, only showed the frequency and percentage changes in a 90-day period and did not take seasonal factors into consideration. In another study, Mantin and Koo (2010) formulated mathematical equations to compare the average price dispersion of airfares 90 days out for the itineraries that departed on every Wednesday between February 27, 2008 and April 2, 2008. Using data retrieved from Farecast.com, empirical findings indicated that the average airfares continuously dropped up to 2 to 3 weeks before departure, and then followed by a sharp increase until the last day before departure. Although the study could be of use, it neither used a fixed day for departure nor included the seasonal factor.

Seasonality and Flight Duration

The effect of seasonality on airfares has always been a topic of academic research. Mason (2006) showed the variation of airfares during different seasons. Furthermore, Garrigos-Simon, Narangajavana, and Gil-Pechuan (2010) found the seasonal factor is always important for airlines to establish their prices. While airfares are at their highest during a peak season (e.g., in summer holidays or during Christmas); consumers would be able to find less expensive airfares during a shoulder season (Jain & Bowman, 2005). A shoulder season is the period between low and high seasons, which can provide many advantages for budget conscious travelers such as avoiding the crowded places and long queues as well as the highest airfares and hotel room rates. In other words, shoulder season travelers can avoid the peak times, but can travel close to the peak

season (Jain & Bowman, 2005). In contrast, consumers can always have a higher bargaining power in a low season during which demand for travel is always lower than the supply of air-tickets. As such, airfares during low seasons are at their lowest.

Although air travel is fast and generally safe, Low and Chan (2002) stated that low cabin pressure, low humidity, very restricted environment, constant noise, and other unfavorable conditions in the aircraft cabin can make air travel an unpleasant experience. Ropers et al. (2008) also expressed concerns about human health during air travel. In another study, Grammatikopoulou, Zakas, Papadopoulou, and Panayiotoglou (2007) implicitly stated that flight duration may be related to health issues. Law et al. (2010) argued that, among all available flights, consumers will usually choose the flight with the shortest durations, ceteris paribus. Taking a flight with the shortest duration, travelers can spend more time in destinations instead of in the aircraft. Despite the importance of shortest duration for flights, the existing tourism literature virtually comprises no published articles that examined the issue in detail. Law et al. (2010) initially checked the shortest durations for flights but they provided no information on the lowest fares for the shortest durations.

Apparently, the existing literature highly emphasizes the importance of pricing and OTAs. This importance, together with the high airfares during peak and shoulder seasons, as well as the crucial factor of shortest duration for flight, strongly hints the importance and urgency of conducting research for checking online airfares in shoulder and high seasons, and online airfares of the shortest durations.

METHODOLOGY

This study—exploratory in nature—investigated a largely overlooked, yet important, area in modern tourism. Data collection was conducted from April 30, 2009 to August 23, 2009 for high season airfares; and from April 30, 2009 to June 30, 2009 for shoulder season airfares. The ending days of both periods were 1 day prior to the high season and shoulder season periods, respectively. Hong Kong, a cosmopolitan city in Asia, was chosen as the departure city due to its well-developed transportation infrastructure and wide connectivity with worldwide destinations. Beijing and Bangkok, two popular travel destinations for Hong Kong travelers and representing the destinations within the same country and within the same continent (Law et al., 2010), were selected as the short-haul travel destinations. In the study, 7-day return air-tickets from Hong Kong to Beijing, and from Hong Kong to Bangkok in the period August 24 to 31, 2009 (for high season) and July 1 to 8, 2009 (for shoulder season) were retrieved in this study. These two time periods were for high and shoulder seasons in Hong Kong. A 7-day duration was used because the cheapest fare rules are applicable to a maximum stay of 7 days (Instant Travel Service, Ltd., 2005).

In spite of the existence of numerous OTAs, 39% of visits to the online travel industry went to the top sites (Eyefortravel, 2010a). During the data collection period, airfare and flight duration information was crawled and parsed from five online intermediary travel websites comprising Expedia, Travelocity, Zuji, Cheaptickets, and Orbitz. These websites represent some of the world's largest online travel service providers (Expedia, Travelocity, and Orbitz), a regional travel website (Zuji), and a specialized travel website that offers additional products like concerts and sports (Cheaptickets). In particular, Zuji is owned by Travelocity but the former website targets at the Asia Pacific region. Similarly, Cheaptickets is affiliated with Orbitz but with additional products and services. McGann (2005) acknowledged that Expedia, Orbitz, and Travelocity are the top three ranked OTAs for air travel. Likewise, Law et al. (2010) stated that these five websites basically comprise most, if not all, major airlines that provide flights from Hong Kong to key travel destinations in the world. Denizci Guillet and Law (2010) made a similar claim that these five websites are among the most popular online travel service providers for the Hong Kong market.

The automated data collection was conducted at 5:00 a.m. on each day. Additionally, to increase the efficiency of data collection, a

Ruby script was prepared and used to perform automatic data gathering. This program would look up the price information just like a customer and download the resulting web pages. The results of the lowest airfares were then parsed into a database for further analysis. All but one websites listed airfares in U.S. currency but excluded taxes and a service charge. At the data organization stage, airfares listed on Zuji were converted from Hong Kong currency to U.S. currency (US$1 = HK$7.8) and a service charge as well as taxes were added (10% for Expedia and Travelocity, and 10.5% for Cheaptickets and Orbitz).

In addition to the lowest airfares, the shortest flight durations from Hong Kong to Bangkok and Beijing were determined. The lowest fares of the air-tickets for the shortest durations were then identified for further analysis.

FINDINGS AND ANALYSIS

Lowest Airfares

To reiterate, this research is to initially investigate the issue of temporal changes of airfares toward fixed departure date, which in turn, enable consumers to determine when the best time is to purchase their air-tickets. In spite of the importance of the topic, the existing tourism literature has no published articles that are related to the topic. As such, the study is exploratory *per se* in that there is no evidence or theory to guide the case. In this study, the researchers seek to gain insight for further examination elsewhere.

Table 1 lists the airlines that provide the lowest airfares or the lowest airfares for the shortest durations. It is interesting to observe that no low cost carriers such as Air Asia were included. In addition, most of the airlines locate their headquarters in Asia. Since the flights were from Hong Kong to Beijing in China and Bangkok in Thailand, such an observation is not a surprise.

Table 2 presents the weekly average lowest airfares from Hong Kong to Bangkok during the data collection period, and toward the fixed departure dates. Each shaded number represents the smallest number for a specific week across different OTAs, both in shoulder and high seasons. Additionally, the italicized and bold numbers are the lowest airfares for specific seasons.

Apparently, no single website offered the lowest airfares consistently throughout the study

TABLE 1. Airlines That Provide the Lowest Fare or the Lowest Fare for the Shortest Duration on Various Websites

	Expedia	Travelocity	Cheaptickets	Zuji	Orbitz
Air China International	Beijing	Beijing	Beijing	Beijing	Beijing
Air France		Bangkok			
Air New Zealand			Bangkok		Bangkok
Bangkok Airways	Bangkok	Bangkok		Bangkok	
Cathay Pacific Airways	Bangkok, Beijing	Bangkok, Beijing		Bangkok, Beijing	
China Airlines				Bangkok	
China Southern Airlines				Beijing	Bangkok, Beijing
Dragonair	Beijing	Beijing		Beijing	
Emirates Airlines	Bangkok	Bangkok, Beijing	Bangkok	Bangkok	Bangkok
Ethiopian Airlines	Bangkok	Bangkok	Bangkok		Bangkok
Hong Kong Express Airways			Beijing		Beijing
Kenya Airways				Bangkok	
Pakistan International Airlines		Bangkok		Bangkok	
Philippine Airlines	Bangkok, Beijing	Bangkok, Beijing		Bangkok, Beijing	
Royal Jordanian		Bangkok	Bangkok	Bangkok	Bangkok
Sri Lankan Airlines	Bangkok		Bangkok	Bangkok	Bangkok
Thai Air International	Bangkok	Bangkok	Bangkok	Bangkok	Bangkok
Trans North Aviation		Beijing			

TABLE 2. Average Weekly Lowest Airfares to Bangkok on Different Websites

Number of weeks prior to departure	Expedia		Travelocity		Cheaptickets		Zuji		Orbitz	
	H	S	H	S	H	S	H	S	H	S
Week 17	194.00 (0.00)		230.00 (0.00)		205.00 (0.00)		193.08 (0.00)		205.00 (0.00)	
Week 16	219.71 (17.57)		294.29 (43.92)		226.60 (19.72)		217.69 (19.07)		229.00 (18.59)	
Week 15	230.00 (0.00)		320.57 (0.53)		241.00 (0.00)		230.18 (0.13)		241.00 (0.00)	
Week 14	230.00 (0.00)		330.29 (47.89)		241.00 (0.00)		230.35 (0.06)		241.00 (0.00)	
Week 13	230.00 (0.00)		343.29 (20.85)		241.00 (0.00)		225.53 (3.32)		241.00 (0.00)	
Week 12	210.00 (18.71)		289.57 (62.83)		220.43 (19.24)		206.52 (15.97)		220.43 (19.24)	
Week 11	194.43 (0.53)		241.00 (0.00)		205.00 (0.00)		174.95 (12.82)		205.00 (0.00)	
Week 10	183.71 (18.25)		230.71 (17.57)		194.14 (18.54)		165.77 (2.16)		194.14 (18.54)	
Week 9	***157.00*** (0.00)	208.00 (0.00)	205.00 (0.00)	230.00 (0.00)	167.00 (0.00)	219.00 (0.00)	163.46 (0.00)	213.08 (0.00)	167.00 (0.00)	219.00 (0.00)
Week 8	167.29 (4.54)	208.00 (0.00)	205.57 (0.53)	230.00 (0.00)	177.86 (4.81)	219.00 (0.00)	172.75 (5.08)	213.21 (0.00)	177.86 (4.81)	219.00 (0.00)
Week 7	169.00 (0.00)	208.86 (0.38)	205.43 (0.53)	230.00 (0.00)	179.43 (0.53)	219.86 (0.38)	169.87 (3.94)	213.46 (0.00)	179.43 (0.53)	219.86 (0.38)
Week 6	169.00 (0.00)	209.00 (0.00)	205.00 (0.00)	227.00 (7.94)	179.00 (0.00)	220.00 (0.00)	167.56 (0.00)	213.59 (0.00)	179.00 (0.00)	220.00 (0.00)
Week 5	176.43 (12.69)	215.00 (10.25)	221.29 (26.79)	244.57 (38.55)	187.00 (12.65)	220.00 (0.00)	179.69 (10.11)	213.72 (0.00)	187.00 (12.65)	220.00 (0.00)
Week 4	169.00 (0.00)	231.00 (0.00)	197.20 (4.92)	332.00 (0.00)	180.00 (0.00)	220.00 (0.00)	175.74 (0.06)	227.23 (27.08)	180.00 (0.00)	220.00 (0.00)
Week 3	169.00 (0.00)	230.00 (0.00)	195.00 (0.00)	332.00 (0.00)	180.00 (0.00)	220.00 (0.00)	175.77 (0.00)	167.44 (0.00)	180.00 (0.00)	220.00 (0.00)
Week 2	169.00 (0.00)	178.14 (36.11)	327.43 (59.33)	332.00 (0.00)	180.00 (0.00)	189.71 (28.33)	175.77 (0.00)	164.63 (2.00)	180.00 (0.00)	189.71 (28.33)
Week 1	196.14 (46.36)	***160.43*** (5.86)	402.00 (0.00)	384.60 (51.56)	207.14 (46.36)	168.71 (4.54)	195.60 (52.71)	163.46 (0.00)	207.14 (46.36)	168.71 (4.54)

Note. H = high season; S = shoulder season.
Numbers in parentheses are the standard deviation values.
Cells with grey shading indicate the lowest price within a week.
Bold and italicized numbers indicate the lowest prices for different seasons.

period but Travelocity and Cheaptickets performed the worst in which none of their airfares was the lowest. During a high season, Expedia offered the lowest airfare in the 9th week prior to departure (US$157), and Zuji offered the second lowest airfare in week 10 (US$165.77). This indicates that it would be to the best interest of budget conscious consumers to make their purchase in the 9th week before their trips. Other weeks during which consumers can purchase their air-tickets with fares of less than US$170 included weeks 2, 3, 4, 6, 7, and 8 prior to departure. Interestingly and contradicting to the misconception that airfares would be less expensive when a purchase is made a long time prior to departure, empirical findings showed the lowest airfares were close to or more than US$200 if the purchase is made in first few weeks during the data collection period. Similarly, the airfares would be toward the high end if the purchase is made at the last minute (i.e., during week 1).

In contrast, the lowest airfare to Bangkok during the shoulder season was found on Expedia

and 1 week prior to departure (US$160.43). The lowest airfares in weeks 2 and 3 prior to departure were both found on Zuji and close to the lowest fare (between US$164.63 to US$167.44). The lowest airfares for shoulder season at other times were all above US$200 (from US$208.00 to US$220.00).

Different from the airfares to Bangkok, the lowest airfares from Hong Kong to Beijing were only found on Zuji in both seasons during the entire data collection period (Table 3). Specifically, weeks 5 to 8, 11, 12, and 17 prior to departure had the lowest airfares of US$440.00 for high season, and weeks 3, 4, and 9 prior to departure had the same fare for shoulder season. Although the fares in different weeks on Zuji were quite low (between $440.00 and $452.45 for high season, and between $440.00 to $441.37 for shoulder season, respectively), fares on other websites could be as high as $701.00 for high season and $697.00 for shoulder season; both numbers were found on Orbitz and Cheaptickets in the last 3 weeks prior to departure.

TABLE 3. Average Weekly Lowest Airfares to Beijing on Different Websites

Number of weeks prior to departure	Expedia		Travelocity		Cheaptickets		Zuji		Orbitz	
	H	S	H	S	H	S	H	S	H	S
Week 17	686.00 (0.00)		669.67 (28.29)		697.00 (0.00)		***440.00*** (0.00)		697.00 (0.00)	
Week 16	686.00 (0.00)		637.00 (0.00)		697.00 (0.00)		440.09 (0.07)		697.00 (0.00)	
Week 15	686.00 (0.00)		637.00 (0.00)		697.00 (0.00)		441.37 (1.16)		697.00 (0.00)	
Week 14	686.00 (0.00)		662.43 (30.00)		697.00 (0.00)		440.35 (0.81)		697.00 (0.00)	
Week 13	686.00 (0.00)		664.57 (26.73)		697.00 (0.00)		441.25 (1.16)		697.00 (0.00)	
Week 12	686.00 (0.00)		670.86 (32.61)		697.00 (0.00)		***440.00*** (0.00)		697.00 (0.00)	
Week 11	686.00 (0.00)		697.00 (0.00)		697.00 (0.00)		***440.00*** (0.00)		697.00 (0.00)	
Week 10	686.00 (0.00)		697.00 (0.00)		697.00 (0.00)		440.31 (0.82)		697.00 (0.00)	
Week 9	686.00 (0.00)	686.00 (0.00)	670.71 (31.57)	686.00 (0.00)	697.00 (0.00)	697.00 (0.00)	440.93 (1.16)	***440.00*** (0.00)	697.00 (0.00)	697.00 (0.00)
Week 8	686.00 (0.00)	686.00 (0.00)	637.00 (0.00)	686.00 (0.00)	697.00 (0.00)	697.00 (0.00)	***440.00*** (0.00)	440.13 (0.00)	697.00 (0.00)	697.00 (0.00)
Week 7	599.71 (80.71)	686.00 (0.00)	645.86 (8.76)	686.00 (0.00)	697.00 (0.00)	697.00 (0.00)	***440.00*** (0.00)	441.37 (1.16)	697.00 (0.00)	697.00 (0.00)
Week 6	535.00 (0.00)	686.00 (0.00)	649.00 (0.00)	686.00 (0.00)	697.00 (0.00)	697.00 (0.00)	***440.00*** (0.00)	440.93 (1.16)	697.00 (0.00)	697.00 (0.00)
Week 5	516.00 (0.00)	686.00 (0.00)	637.00 (0.00)	687.57 (4.16)	697.00 (0.00)	697.00 (0.00)	***440.00*** (0.00)	440.62 (1.06)	697.00 (0.00)	697.00 (0.00)
Week 4	524.40 (9.81)	686.00 (0.00)	645.40 (9.81)	697.00 (0.00)	697.80 (1.79)	697.00 (0.00)	441.31 (1.95)	***440.00*** (0.00)	698.00 (2.00)	697.00 (0.00)
Week 3	631.86 (80.23)	686.00 (0.00)	676.00 (23.91)	697.00 (0.00)	701.00 (0.00)	697.00 (0.00)	444.36 (0.00)	***440.00*** (0.00)	701.00 (0.00)	697.00 (0.00)
Week 2	675.00 (26.95)	686.00 (0.00)	690.00 (0.00)	697.00 (0.00)	701.00 (0.00)	697.00 (0.00)	444.36 (0.00)	440.93 (1.16)	701.00 (0.00)	697.00 (0.00)
Week 1	651.71 (35.81)	686.00 (0.00)	690.00 (0.00)	697.00 (0.00)	701.00 (0.00)	697.00 (0.00)	452.45 (13.83)	440.36 (0.89)	701.00 (0.00)	697.00 (0.00)

Note. H = high season; S = shoulder season.
Numbers in parentheses are the standard deviation values.
Cells with grey shading indicate the lowest price within a week.
Bold and italicized numbers indicate the lowest prices for different seasons.

Lowest Airfares for the Shortest Durations

Table 4 shows the flight durations of the lowest airfares in both seasons. As previously stated, prior studies in the existing tourism literature have virtually overlooked the issue of the lowest airfares for the shortest flight duration.

Attributed to the availability of indirect flights, Travelocity's flights in both seasons to Bangkok could take as long as 9.5 hours whereas flights from other websites needed at most 2.83 hours. ANOVA results showed the existence of significance differences between Travelocity and other websites for flights to Bangkok. Other than Travelocity, Expedia offered indirect flights to Beijing during high season. This, in turn, leads to the significant differences in the length of the shortest duration among different websites for flights to Beijing during high season. Lastly, although there was a significant difference between Expedia and other websites for flights to Beijing during shoulder season with the shortest duration, such a 5-minute difference does not seem to be a major concern (Table 4).

Tables 5 and 6 list the lowest weekly fares of the shortest durations for the flights to Bangkok and Beijing. Apparently, the figures of the lowest airfares in Tables 5 and 6 matched the corresponding numbers in Tables 2 and 3, and were on the same websites. Although Travelocity offered indirect flights to Bangkok, these indirect flights did not appear to be among the lowest airfares at any time. The lowest fares were still found on Expedia, with the second level of the lowest airfares found on Zuji. Likewise, although Expedia and Travelocity did offer indirect flights to Beijing, the lowest airfares during the shortest durations were all found on Zuji. In other words, irrespective of whether the lowest airfares were for the shortest durations or not, consumers are expected to pay the same amount, and make their purchase from the same websites for short-haul flights. This finding suggests the irrelevancy of shortest duration in relation to the lowest airfares for short-haul travel. Further studies are, however, needed to confirm such a conjecture by analyzing more websites and with different destinations.

DISCUSSION AND IMPLICATIONS

Apparently, the airfares between the shortest durations and other times were the same during

TABLE 4. ANOVA Analysis for Flight Durations of the Lowest Airfares Among Different Websites

		Expedia	Travelocity	Cheaptickets	Zuji	Orbitz	*df*	*F*	Sig.
Bangkok high season	Mean	2.70[1]	4.34[1,2,3,4]	2.70[2]	2.72[3]	2.70[4]	4	34.160	.000
	SD	0.07	2.88	0.07	0.06	0.07			
	Min.	2.67	2.67	2.67	2.67	2.67			
	Max.	2.83	9.50	2.83	2.83	2.83			
Bangkok shoulder season	Mean	2.84[1]	5.63[1,2,3,4]	2.93[2]	2.73[3]	2.93[4]	4	39.659	.000
	SD	0.17	3.41	0.13	0.04	0.13			
	Min.	2.67	2.67	2.67	2.67	2.67			
	Max.	3.00	9.50	3.00	2.75	3.00			
Beijing high season	Mean	6.03[1,2,3,4]	9.28[1,5,6,7]	3.25[2,5]	3.25[3,6]	3.25[4,7]	4	64.895	.000
	SD	4.80	5.50	0.00	0.00	0.00			
	Min.	3.25	3.25	3.25	3.25	3.25			
	Max.	14.25	14.25	3.25	3.25	3.25			
Beijing shoulder season	Mean	3.25[1,2,3,4]	3.25[1]	3.25[2]	3.25[3]	3.25[4]	4	3.013	.019
	Std.	0.02	0.00	0.00	0.00	0.00			
	Min.	3.25	3.25	3.25	3.25	3.25			
	Max.	3.33	3.25	3.25	3.25	3.25			

Note. The measurement scale is in number of hours.
[1–7]$p = .00$ is significant at a .05 level.

TABLE 5. Average Weekly Lowest Airfares of the Shortest Duration to Bangkok on Different Websites

Number of weeks prior to departure	Expedia		Travelocity		Cheaptickets		Zuji		Orbitz	
	H	S	H	S	H	S	H	S	H	S
Week 17	194.00 (0.00)		230.00 (0.00)		205.00 (0.00)		193.08 (0.00)		205.00 (0.00)	
Week 16	219.71 (17.57)		294.29 (43.92)		226.60 (19.72)		217.69 (19.07)		229.00 (18.59)	
Week 15	230.00 (0.00)		320.57 (0.53)		241.00 (0.00)		230.18 (0.13)		241.00 (0.00)	
Week 14	230.00 (0.00)		330.29 (47.89)		241.00 (0.00)		230.35 (0.06)		241.00 (0.00)	
Week 13	230.00 (0.00)		343.29 (20.85)		241.00 (0.00)		225.53 (3.32)		241.00 (0.00)	
Week 12	210.00 (18.71)		289.57 (62.83)		220.43 (19.24)		206.52 (15.97)		220.43 (19.24)	
Week 11	194.43 (0.53)		241.00 (0.00)		205.00 (0.00)		174.95 (12.82)		205.00 (0.00)	
Week 10	183.71 (18.25)		230.71 (17.57)		194.14 (18.54)		165.77 (2.16)		194.14 (18.54)	
Week 9	***157.00*** (0.00)	208.00 (0.00)	205.00 (0.00)	230.00 (0.00)	167.00 (0.00)	219.00 (0.00)	163.46 (0.00)	213.08 (0.00)	167.00 (0.00)	219.00 (0.00)
Week 8	167.29 (4.54)	208.00 (0.00)	205.57 (0.53)	230.00 (0.00)	177.86 (4.81)	219.00 (0.00)	172.75 (5.08)	213.21 (0.00)	177.86 (4.81)	219.00 (0.00)
Week 7	169.00 (0.00)	208.86 (0.38)	205.43 (0.53)	230.00 (0.00)	179.43 (0.53)	219.86 (0.38)	169.87 (3.94)	213.46 (0.00)	179.43 (0.53)	219.86 (0.38)
Week 6	169.00 (0.00)	209.00 (0.00)	205.00 (0.00)	227.00 (7.94)	179.00 (0.00)	220.00 (0.00)	167.56 (0.00)	213.59 (0.00)	179.00 (0.00)	220.00 (0.00)
Week 5	176.43 (12.69)	215.00 (10.25)	221.29 (26.79)	244.57 (38.55)	187.00 (12.65)	220.00 (0.00)	179.69 (10.11)	213.72 (0.00)	187.00 (12.65)	220.00 (0.00)
Week 4	169.00 (0.00)	231.00 (0.00)	197.20 (4.92)	332.00 (0.00)	180.00 (0.00)	220.00 (0.00)	175.74 (0.06)	227.23 (27.08)	180.00 (0.00)	220.00 (0.00)
Week 3	169.00 (0.00)	230.00 (0.00)	195.00 (0.00)	332.00 (0.00)	180.00 (0.00)	220.00 (0.00)	175.77 (0.00)	167.44 (0.00)	180.00 (0.00)	220.00 (0.00)
Week 2	169.00 (0.00)	178.14 (36.11)	327.43 (59.33)	332.00 (0.00)	180.00 (0.00)	189.71 (28.33)	175.77 (0.00)	164.63 (2.00)	180.00 (0.00)	189.71 (28.33)
Week 1	196.14 (46.36)	***160.43*** (5.86)	402.00 (0.00)	384.60 (51.56)	207.14 (46.36)	168.71 (4.54)	195.60 (52.71)	163.46 (0.00)	207.14 (46.36)	168.71 (4.54)

Note. H = high season; S = shoulder season.
Numbers in parentheses are the standard deviation values.
Cells with grey shading indicate the lowest price within a week.
Bold and italicized numbers indicate the lowest prices for different seasons.

the data collection period. In other words, duration would not be an important factor that influences airfares. As such, consumers, especially budget conscious consumers, should primarily focus on airfares on their short-haul travel. Another interesting and unexpected finding, as revealed from the empirical data, is that the lowest airfares were not found in the shoulder season. For flights to Bangkok, the lowest airfares (US$157.00) in high season were found in week 9 prior to departure; whereas the corresponding airfare for shoulder season (US$160.43) was found 1 week prior to departure. In contrast, the lowest airfares for flights to Beijing were US$440.00 in both seasons. Additionally, different websites performed differently in terms of offering the lowest airfares. Travelocity basically did not offer any lowest airfares to both destinations. Similarly, Orbitz and Cheaptickets only offered lowest airfares in week 4 in the shoulder season.

On the basis of the findings, it would be to the best interest of consumers if they purchase their flights to Bangkok 7 to 10 weeks in advance

TABLE 6. Average Weekly Lowest Airfares of the Shortest Duration to Beijing on Different Websites

Number of weeks prior to departure	Expedia		Travelocity		Cheaptickets		Zuji		Orbitz	
	H	S	H	S	H	S	H	S	H	S
Week 17	686.00 (0.00)		686.00 (0.00)		697.00 (0.00)		***440.00*** (0.00)		697.00 (0.00)	
Week 16	686.00 (0.00)		686.00 (0.00)		697.00 (0.00)		440.09 (0.07)		697.00 (0.00)	
Week 15	686.00 (0.00)		686.00 (0.00)		697.00 (0.00)		441.37 (1.16)		697.00 (0.00)	
Week 14	686.00 (0.00)		686.00 (0.00)		697.00 (0.00)		440.35 (0.81)		697.00 (0.00)	
Week 13	686.00 (0.00)		686.00 (0.00)		697.00 (0.00)		441.25 (1.16)		697.00 (0.00)	
Week 12	686.00 (0.00)		695.43 4.16		697.00 (0.00)		***440.00*** (0.00)		697.00 (0.00)	
Week 11	686.00 (0.00)		697.00 (0.00)		697.00 (0.00)		***440.00*** (0.00)		697.00 (0.00)	
Week 10	686.00 (0.00)		697.00 (0.00)		697.00 (0.00)		440.31 (0.82)		697.00 (0.00)	
Week 9	686.00 (0.00)	686.00 (0.00)	697.00 (0.00)	686.00 (0.00)	697.00 (0.00)	697.00 (0.00)	440.93 (1.16)	***440.00*** (0.00)	697.00 (0.00)	697.00 (0.00)
Week 8	686.00 (0.00)	686.00 (0.00)	697.00 (0.00)	686.00 (0.00)	697.00 (0.00)	697.00 (0.00)	***440.00*** (0.00)	440.13 (0.00)	697.00 (0.00)	697.00 (0.00)
Week 7	686.00 (0.00)	686.00 (0.00)	697.00 (0.00)	686.00 (0.00)	697.00 (0.00)	697.00 (0.00)	***440.00*** (0.00)	441.37 (1.16)	697.00 (0.00)	697.00 (0.00)
Week 6	686.00 (0.00)	686.00 (0.00)	697.00 (0.00)	686.00 (0.00)	697.00 (0.00)	697.00 (0.00)	***440.00*** (0.00)	440.93 (1.16)	697.00 (0.00)	697.00 (0.00)
Week 5	686.00 (0.00)	686.00 (0.00)	697.00 (0.00)	687.57 (4.16)	697.00 (0.00)	697.00 (0.00)	***440.00*** (0.00)	440.62 (1.06)	697.00 (0.00)	697.00 (0.00)
Week 4	686.80 (1.79)	686.00 (0.00)	689.00 (4.80)	697.00 (0.00)	697.80 (1.79)	697.00 (0.00)	441.31 (1.95)	***440.00*** (0.00)	698.00 (2.00)	697.00 (0.00)
Week 3	690.00 (0.00)	686.00 (0.00)	690.00 (0.00)	697.00 (0.00)	701.00 (0.00)	697.00 (0.00)	444.67 (0.82)	***440.00*** (0.00)	701.00 (0.00)	697.00 (0.00)
Week 2	690.00 (0.00)	686.00 (0.00)	690.00 (0.00)	697.00 (0.00)	701.00 (0.00)	697.00 (0.00)	444.36 (0.00)	440.93 (1.16)	701.00 (0.00)	697.00 (0.00)
Week 1	690.00 (0.00)	686.00 (0.00)	690.00 (0.00)	697.00 (0.00)	701.00 (0.00)	697.00 (0.00)	452.77 (13.64)	441.09 (1.19)	701.00 (0.00)	697.00 (0.00)

Note. H = high season; S = shoulder season.
Numbers in parentheses are the standard deviation values.
Cells with grey shading indicate the lowest price within a week.
Bold and italicized numbers indicate the lowest prices for different seasons.

during high season, or 1 week prior to departure for shoulder season flights. They should also use multiple channels (e.g., Expedia and Zuji) to receive the lowest airfares. Although the lowest airfares to Bangkok were found on Expedia during both seasons, about half of the lowest weekly fares were found on Zuji. Travelocity, being the possessor of Zuji, did underperform by returning high airfares for both seasons. This, in turn, indicates the difference between global reach and local wisdom. For flights to Beijing, Zuji simply outperformed all other websites in terms of airfares. While the airfares on Zuji were between US$440.00 to US$452.45, with the exception of weeks 4 to 7 on Expedia, fares on the other four websites were more than US$600 with many of them approaching or even exceeding US$700. In short, findings of this study, in contrast to the suggestion offered by Mantin and Koo (2010) that price-sensitive consumers should purchase their air-tickets early, offer more realistic implications for the best time that consumers should purchase their air-tickets.

Airlines should also frequently review airfares on their own websites, and continuously adjust their online prices in order to remain competitive. Consumers are likely to purchase from the channel with the lowest fares. Given that the cost of mediation is always high, it would thus be to the interest of airlines to analyze the level of business exposure that they can receive from third-party websites. Airlines can then decide the optimal level of online presence, and more importantly the optimal level of airfares on third-party distribution channels. Although airlines are trying to regain their market by selling most air-tickets directly to passengers by 2013, the Internet will likely to remain as the leading channel of distribution (Eyefortravel, 2010b).

Despite the existence of various advantages, booking air-tickets online is associated with different barriers (Ruiz-Mafe, Sanz-Blas, & Aldas-Manzano, 2009). Similarly, Tse and Yim (2001) found using the online distribution channels always relates to different challenges as comparing to the conventional channels. Yu (2008) even found online air-ticket shoppers perceived price more negatively than offline shoppers in Taiwan. As such, travel and tourism practitioners should monitor the performance of their websites on a continuous basis in order to remain competitive.

CONCLUSIONS AND FUTURE RESEARCH

This study has contributed to identify, and initially investigated the temporal changes of airfares toward a fixed departure date, representing an important but not yet explored area in tourism research. In spite of the limited scope of this study, findings do offer useful insights for tourism researchers and practitioners to better understand the current practice of online prices for airfares. In addition, consumers can have a more realistic estimation of the best time to purchase airfares from online travel websites. In other words, the "So What?" question has been partly answered. At the end of June 2010, there were nearly 2 billion Internet users in the world, representing a 445% increase as compared to 2000 (Internet World Stats, 2010). Such a large number of potential consumers does provide enough reasons for industrial practitioners to keep investing on their websites.

Tourism and hospitality scholars have stated the early stage of the present development on online pricing of tourism products (Dabas & Manaktola, 2007; Law et al., 2007; Tsang, Lai, & Law, 2010). Findings of this study thus verify the complexity of online pricing in tourism. Still, there are some limitations in this research which hinder the general applicability of the empirical findings. A major limitation of this study is the relatively short time period for data collection. In other words, the findings that are based on 17 weeks' data may not necessarily be applicable to other time periods. Another limitation is the inclusion of two short-haul destinations and five OTAs. As such, it remains largely unknown if similar findings would be obtained when the coverage of destinations and/or OTAs is enlarged. These limitations certainly deserve future research endeavors.

Additionally, in future research efforts, academic researchers can improve the existing financial models by incorporating the empirical findings into these models. Other directions for future research include an examination of different types of flights (e.g., traditional and charter) separately, and extending the data collection period longitudinally for other years. Lastly, the fixed time of data downloading on each day excluded the occasional discounts at different hours. As such, it would be interesting to investigate the variations of airfares continuously on a daily basis.

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