IRMM
INTERNATIONAL REVIEW OF MANAGEMENT AND MARKETING
EJ EconJournals
ISSN: 2146-4405

International Review of Management and Marketing

ISSN: 2146-4405

available at http: www.econjournals.com

International Review of Management and Marketing, 2018, 8(1), 1-8.

After the Recent US Airline Mergers, Did Domestic Airfares Increase?

Samuel D. Barrows*

Senior Lecturer at STEM Business School, Turan University, Kazakhstan and Doctorate of Business Administration Candidate, Toulouse Business School, France. *Email: sam_barrows@yahoo.com

ABSTRACT

The dynamics of the US domestic airfares are studied between 2002 and 2016. During this time frame, there was significant airline industry consolidations resulting in additional market concentration in the top four airlines and in the industry as a whole. The potential airfare increase resulting from this higher concentration is evaluated on both real and inflation adjusted bases through two cases. An analysis of load factors and passenger miles and their link with the airfare increases are also evaluated through two additional cases. A breakdown of all origin hubs in the US network is included which shows a vastly different airfare increase picture in the top twenty major hubs as compared to the smaller origins. Having healthy competition usually results in lower fares and this analysis confirms that dynamic. There are discussions on industry concentration, industry profitability, pricing power, and other items which can impact airfares.

Keywords: Airline Industry Mergers, Airfares Increase, Market Power Concentration
JEL Classifications: L93, G34, R41

1. INTRODUCTION

The study objective is to examine the US airline mergers which occurred between 2002 and 2016 then evaluate the US domestic airfares and establish if they increased during this time frame. A look into the airline industry concentration gives insight into some of the dynamics affecting pricing and overall performance across the US network. The study time frame sees passenger traffic plummet at the outset of the period due to fallout from 9/11. Increases in fuel cost adds further misery to the industry players as they grapple with how to best proceed back to the profitability they enjoyed in the 1990s.

Two hypotheses provide some insight into the dynamics related to pricing and airline traffic. The first hypothesis is that during the study timeframe, both real and inflation adjusted airfares increase. To evaluate this, real and inflation adjusted quarterly airfares are compared to corresponding quarterly assessments to determine whether the airfares have indeed increased. The second hypothesis is that both the load factors and passenger miles increase. During this evaluation, it is important to note that each of these measurements provide a different perspective. Load factors reveal how the industry is managing its utilization or how efficient it is whereas passenger miles reflect the overall growth in demand during the time frame. Both are measured quarterly and evaluated against the quarterly price assessments.

Four cases are used to determine the hypothesis testing as described in the paragraph above. In addition, the entire network is evaluated with the intent to determine if there are different airfare increases based on the size of the markets. The anticipation is that due to more intense competition in the major hubs, the airfare increases there were less than at the smaller locations during the study time frame. This expectation is realized as the airfare increases in the twenty major hubs are substantially different that in the remaining origin points in the rest of the US network.

Contributions of the study include confirmation that the airfares do increase during the study time frame. However, the dynamic between real airfares and inflation adjusted airfares shows a divergent pattern. The results of the study include confirmation in a number of areas including those which document industry

concentration leading to pricing power (Chen et al., 1989; Kim and Singal, 1993). Also studies which document factors which impact airfares are included in the analysis and the results of this study confirm many of the prior research including the following studies (Belobaba, 1987; Das and Reisel, 1997; Pinkham, 1999; Bhadra, 2003; Rubin and Joy, 2005; Brown, 2014).

2. LITERATURE REVIEW

2.1. Recent History of the Airline Industry

In the US airplane manufacturing industry, 1978 was a bellwether year. During the year, there were more than 14,000 single-engine aircraft constructed and there were twenty nine manufacturers of general aviation aircraft (Cook, 1995). During the same year, the US Airline Deregulation Act was signed which removed government control over many aspects of aviation including fares, routes and the new entry of airlines (Congress, 1978). The act introduced more free market mechanisms which had the effect of decreasing fares and increasing the number of flights and the number of passengers flown.

During the Carter administration in the 1970s, "airlines were the first of the transportation industries to experience deregulation" (Brown, 2014). Other transportation industries which were deregulated during this time included trucking and railroad (Crain, 2007). Deregulation allowed for economic flexibilities that would reduce inflation (Brown, 2014). Because in the 1970s, trucking, railroads and the airlines were having difficulty due to inflationary pressures (Crain, 2007).

Prior to deregulation, the Civil Aeronautics Board (CAB) regulated the airline industry through the approval of entry and exit of airlines and the routes they served (Brown, 2014). "The CAB allowed only one or two airlines to serve most routes" which kept prices high and kept passenger volume down (Crain, 2007). The "routes and fares were strictly regulated, which minimized competition between airlines" (Helleloid et al., 2015). The CAB also regulated the airfares and mandated that longer distance routes received a higher fare than short distance flights (Kaplan and Dayton, 1988). The result was that many fare structures were out of line with their economic justifications (Pinkham, 1999).

On October 24, 1978, President Carter signed the Airline Deregulation Act. The bill deregulated the airline industry with the intent of increasing competition. This deregulation included route selection; fare establishment; acceptance of new entrants; avoidance of excessive concentration to guard against undue market power; and the dissolution of the CAB (Congress, 1978).

2.2. Airline Industry Performance

After deregulation, airline industry performance improved despite the entrance of low cost carriers (Brown, 2014). Between 1978 and 1988, adjusted for inflation, fares fell more than twenty percent while passengers flown increased by more than 85% (Pinkham, 1999). Industry load factors increased from 55% to more than 60% in 1982 (Bailey et al., 1985). Over the next 10 years, "load factors continued to rise, reaching 64% in 1993" (Morrison and Winston, 1995). Load factor measures efficiency utilization and its growth shows improvements after deregulation (Brown, 2014).

"Between 1976 and 1981 no doubt represents the airlines' initial adaptation to deregulation" (Brown., 2014). In the 1980s, airline mergers were a result of the upheaval in the industry (Kim and Singal, 1993). During this decade, the business environment witnessed industry consolidations spurred on by decreasing antitrust concerns and increasing financing options (Ollinger, 1994). At the time, "antitrust regulators generally examine only the price effects of acquisitions" (Prince and Simon, 2017). Established players were able to reorganize their routes to gain efficiencies (Brown, 2014). By the end of the 1980s, the three largest carriers owned half of the market share (Helleloid et al., 2015). The 1990s saw annual load factors exceeding 70% (MIT, 2017). This led to positive overall airline industry net incomes that averaged above $5 billion from 1997 through 1999 (BTS, 2017b).

The industry's good times changed in 2001. After 9/11, the airline industry found itself in one of the biggest downturns since the 1978 deregulation (Bateman and Westphal, 2011). The industry saw itself slide into a slump (Brown, 2014). The travel delays and aggravations surrounding the additional screening took their toll on passenger numbers (Rubin and Joy, 2005). When economic conditions were good, airline travel increased, but when economic conditions were questionable, utilization fell which caused losses (Helleloid et al., 2015). The next shoe to drop was the rising fuel costs in the 2000s (Jelveh, 2008). The US airline industry lost money every year from 2001 through 2005 with 2005 having the highest annual loss of more than $27 billion (BTS, 2017b). Figure 1 is from the Bureau of Transportation Statistics, U.S. Department of Transportation, Air Carrier Financial: Schedule P-1.2 Net Income (BTS, 2017b).

One thing to notice is that the airline industry is an oligopoly and many oligopoly industries have high fixed costs due to the capital investments required for market entry (Rubin and Joy, 2005). In the airline industry, aircraft purchases are one of the highest cost items, but can be lowered through lease arrangements (Helleloid et al., 2015). Two other significant costs are fuel and labor (Air Transport Association, 2017).

In the mid-1990s, fuel costs were less than twenty percent of operating costs, 10 years later they approached forty percent (Jelveh, 2008). The dynamics are that airline operating costs are mostly fixed and profitability is dependent upon utilization or the load factor (Helleloid et al., 2015). The slow economy and rising fuel costs pushed the industry toward M&A activity (Sorkin and Bailey, 2008). More precisely, the mergers during the 2000s were a response to factors such as rising costs for fuel and labor (Bateman and Westphal, 2011).

2.3. Airline Industry Consolidation

During this time, the largest airlines went into bankruptcy, then to mergers. United was in bankruptcy protection between 2002 and 2006 (USA Today, 2006). In 2009, Northwest joined Delta and in 2010, Continental joined United (Prince and Simon, 2017). Prior to this, Northwest and Delta were in bankruptcy protection

(Helleloid et al., 2015). Southwest and Air Tran joined together in 2011 (Prince and Simon, 2017). "American filed for bankruptcy in 2011" then announced its merger with US Airways in 2013 (Helleloid et al., 2015). Table 1 shows snapshots of the industry in 2002 and 2016 from Bureau of Transportation Statistics, U.S. Department of Transportation, Air Carrier Financial: Schedule P-1.2 Operating Revenues (BTS, 2017c).

The US based carriers are divided into three groups: network airlines which operate domestic and international routes; discount airlines which serve limited routes and were generally born after deregulation; and regional airlines which fly in only limited target markets (Helleloid et al., 2015). The largest examples for the three types based on 2016 operating revenues are American Airlines, Southwest Airlines, and Alaska Airlines, respectively (BTS, 2017c).

2.4. Impact from Mergers

The industry concentration of the top four players went from 59% to 79% during the study time frame while the Herfindahl-Hirschman index (HHI) for the industry increased from 1113 to 1704 showing that the industry has acquired more market power during the time frame. The regulatory guidelines assume that an HHI of <1.800 would not be concentrated enough that "firms in the market would have the market power to maintain prices above the competitive level for a significant period" (Rhoades, 1993). Despite being below the HHI threshold, in 2015 the US Department of Justice began investigating collusion between airlines with regard to airfares (Harwell et al., 2015; Helleloid et al., 2015).

Even though the airlines show industry concentration and some of the companies may exhibit levels of market power, the overall picture is more complex. "Firms in an oligopoly are interdependent, and each recognizes that its market power is vulnerable to erosion by competitors or new market entrants" (Rubin and Joy, 2005). Due to the fungible nature of the airline service and its low "switching costs," price wars can happen especially during slack or off-peak travel times which can result in price reductions (Das and Reisel, 1997).

"When airlines face each other in several markets they may compete less vigorously due to the fear of retaliation" (Kim and Singal, 1993). This dynamic is coined as living by the "golden rule" that airlines "refrain from initiating aggressive pricing actions in a given route for fear of what their competitors might do in other jointly contested routes" (Evans and Kessides, 1994). "In 1989, Midway Airlines cut its prices in Milwaukee, an important market for Northwest. Northwest retaliated, not by matching fare cuts in Milwaukee, but by slashing fares at Midway's Chicago hub, where the fare cuts would hurt Midway the most" (Kim and Singal, 1993).

The resultant outcomes from mergers "generally fall into two categories: efficiencies and market power" in which improved efficiencies can benefit both consumers and stockholders whereas

Figure 1: Net income

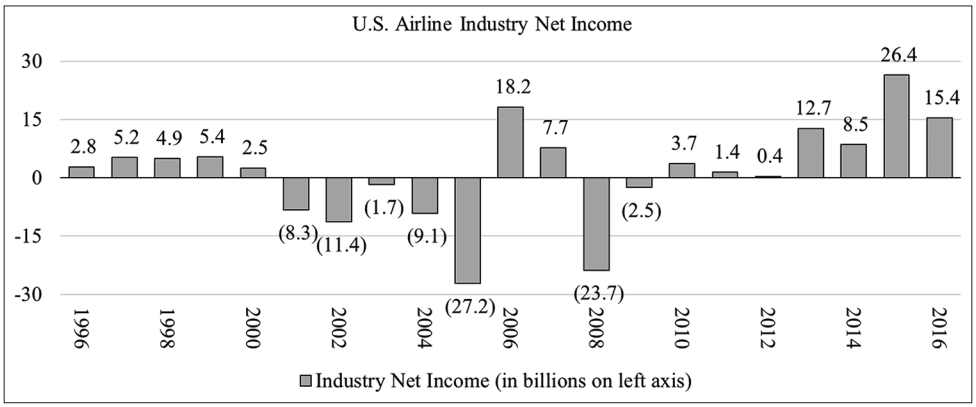


Table 1: US airline industry market comparison based on operating revenues in 2002 and 2016

Rank	Airlines in 2016	Market share (%)	HHI	Airlines in 2002	Market share (%)	HHI
1.	American	24	567	American	19	373
2.	Delta	23	523	United	16	248
3.	United	21	440	Delta	14	197
4.	Southwest	12	137	Northwest	10	107
5.	JetBlue	4	14	Continental	8	69
6.	Alaska	3	11	US Airways	8	61
7.	Hawaiian	1	2	Southwest	6	39
8.	Spirit	1	2	America West	2	5
9.	SkyWest	1	1	Alaska	2	4
10.	Frontier	1	1	ATA airlines	1	2
	Total top 4	79	1668	Total top 4	59	926
	Total top 10	91	1700	Total top 10	88	1107
	Total industry	100	1704	Total industry	100	1113

HHI: Herfindahl-Hirschman index

market power more likely transfers value from consumers to stockholders (Prince and Simon, 2017). "Concentration per se is alleged to foster collusion and cooperative pricing that in turn give rise to monopoly rents" (Chen et al., 1989). Moreover, firms can use this increased market power upon deal consummation (Kim and Singal, 1993). Whereas efficiencies take time to realize and depend upon the performance of the integration (Prince and Simon, 2017).

The recent airline mergers had the effect of increasing the industry load factor by eliminating redundant routes (Prince and Simon, 2017). However, when a new entrant offers a lower fare to gain market share, competition may also lower fares at least temporarily. The "Southwest Effect" is the dynamic when a new competitor offers a lower price fare and the competitors respond which increases overall traffic on that route (Bennett and Craun, 1993).

Back to the load factors, "load factors had previously reached 80 percent only in peak travel season" (Brown, 2014). Beginning in 2009 and each subsequent year after, the annual load factors were >80 with 2014, 2015, and 2016 >84 for each of the years (BTS, 2017d). Figure 2 shows the US carrier load factor and the US airline industry net income with data from the Bureau of Transportation Statistics, U.S. Department of Transportation, Air Carrier Financial: Schedule P-1.2 net income (BTS, 2017b) and Load Factor (BTS, 2017d).

After the great recession, profitability has increased for the airline industry (BTS, 2017b). During this time, industry concentration has also increased (BTS, 2017c). Mergers could lead to higher fares in some markets because of reduced competition (Sorkin and Bailey, 2008). "Price increases are positively correlated with changes in concentration" (Kim and Singal, 1993). "A combination of an improving economy, lower oil prices, reduction in the number of competitors, increases in ancillary revenue, and cost cutting efforts all contributed to this improved profit picture" (Helleloid et al., 2015). There is some evidence of this pricing power "suggesting that airlines exploit greater market power on longer routes for which substitution by other modes of transport is less likely" (Kim and Singal, 1993).

3. METHODOLOGY

The methodology to collect and evaluate data uses the empirical-analytic approach. This type of research is focused on using objective knowledge acquired from deductive reasoning using the collection of objective data. Since quantitative methods are used, the data should enable the determination of performance. The data provider used to assemble the necessary data for this study is the Bureau of Transportation Statistics, U.S. Department of Transportation for Load Factor (BTS, 2017d), Revenue Passenger Miles (BTS, 2017e), and National-Level Domestic Average Fare Series (BTS, 2017f).

The three sets of data points include quarterly average prices, quarterly domestic load factors, and quarterly US passenger miles. The quarterly average prices and quarterly average prices adjusted for inflation are set to a static distance (900 miles or 1448.41 kms) in order to make valid comparison since the average fare computation includes the average distance as well. Evaluating only on average fare would not provide a valid comparison as the average flight distance changed each quarter. The quarterly load factors and passenger miles are compared against the quarterly average prices to determine the link between the respective measurements. The study time frame is from Q4 2002 through Q2 2016. Below is the research question of this study.

Research question: After the US airline mergers, did domestic airfares increase?

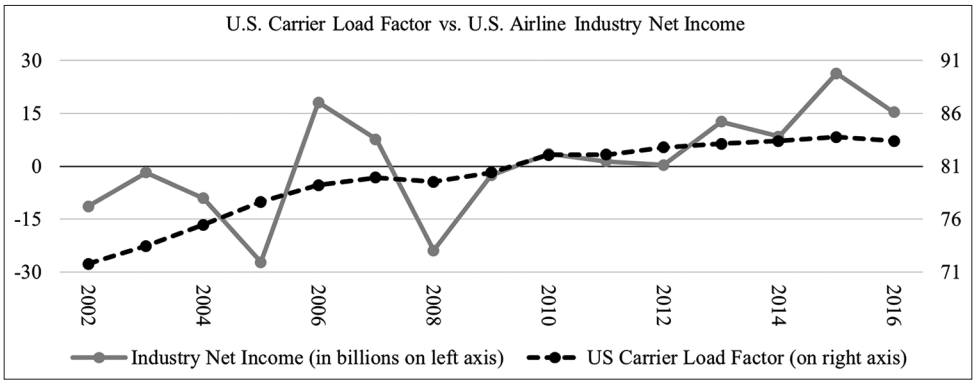
The research approach is classified as causal and correlational. The intent is to establish a causal connection and quantify the relationship between the dependent variables and the corresponding independent variables. This analytic approach utilizes cases which examine these dynamics during the study time frame. To further explore this topic and focus on quantifying the research question, two hypotheses are considered.

H_1: During the study timeframe, both real and inflation adjusted airfares increase.

H_2: During the study timeframe, both the load factors and passenger miles increase.

In H_1, the quarterly average prices is the dependent variable and the independent variable is the base average prices per 900 miles. This comparison is made in case 1 and 2 in Table 2. In H_2, the independent variable is the quarterly average prices per 900 miles and the dependent variable is either the quarterly US domestic

Figure 2: Load factor and net income



load factor in case 3 or the quarterly US carrier passenger miles in case 4. These cases are listed in the Table 2.

Regarding the first hypothesis, the expectation is that both quarterly average prices measures (either adjusted for inflation or not) to be higher than the base average prices measures. In other words, the expectation is that the intercept in each regression to be significantly positive. Indeed, as mergers during the decade lead to a higher market concentration of the sector, the expectation is for airfares to increase with the resulting increased market power of airline companies. Regarding the second hypothesis, the expectation is that through consolidation the industry has become more efficient based on the load factor and the overall market has grown based on the number of passenger miles.

4. RESULTS

A summary of the results of the cases analyzed is included in Table 3.

Cases 1 and 2 have divergent results. In case 1, the quarterly average prices per 900 miles is superior to the base average prices per 900 miles at a 0.01 level. This confirms that the actual airfares increased during the study time frame. Conversely, in case 2, the quarterly average prices adjusted for inflation per 900 miles is inferior to the base average prices adjusted for inflation per 900 miles at a 0.01 level which is contrary to the first hypothesis. The case 2 results reject that the inflation adjusted airfares have increased.

Cases 3 and 4 show similar results to each other. In case 3, the quarterly US domestic load factor performance is superior to the quarterly average prices per 900 miles at a 0.01 level. This confirms that the load factors during the study time frame have increased relative to the quarterly average prices per 900 miles. In case 4, the quarterly US carrier passenger miles performance is superior to the quarterly average prices per 900 miles at a 0.01 level. This confirms that US passenger miles during the study time frame have increased relative to the quarterly average prices per 900 miles.

On the subject of hypothesis testing, all four cases have intercept readings at the 0.01 level which confirms that the measurements associated with these readings are statistically significant for the purpose of hypothesis testing. With regard to the first hypothesis considered, H_1: During the study timeframe, both the real and inflation adjusted airfares increase, the case results are mixed. The real airfares increased as confirmed in case 1, but the inflation adjusted airfares in case 2 did not increase. Based on these results the H_1 hypothesis is rejected. Both the real and inflation adjusted airfares did not increase during the study time frame.

The case 1 results are in line with studies that show an increase in airfares after merger activity. One study summarizes that market concentration contributes to pricing power (Chen et al., 1989). Another study also confirms this stating that "mergers may lead to more efficient operations, but on the whole, the impact of efficiency gains on airfares is more than offset by exercise of increased market power" (Kim and Singal, 1993).

The case 2 results confirm a reduction in airfares when adjusted for inflation. Other studies also show a reduction in airfares when adjusted for inflation. There is a similar dynamic during the first 10 years after airline deregulation when airfares fell more than 20% adjusted for inflation (Pinkham, 1999). One such reason would be because of the low "switching costs," price wars can occur especially for off-peak travel (Das and Reisel,

Table 2: Comparison of cases

Analytical cases: Airfare comparisons	Base average prices per 900 miles	Base average prices+inflation per 900 miles	Quarterly average prices per 900 miles
1. Quarterly average prices per 900 miles	X		
2. Quarterly average prices+inflation per 900 miles		X	
3. Quarterly US domestic load factor			X
4. Quarterly US carrier passenger miles (domestic+international)			X

Table 3: Comparison of results

Regression statistics table	Intercept	T-stat	Adjusted R^2	Standard error
	*=10%,	**=5%,	***=1% denote significance levels	
Quarterly average prices per 900 miles compared to Base average prices per 900 miles	12.53***	3.53	(0.02)	26.33
Quarterly average prices plus inflation per 900 miles compared to base average prices plus inflation per 900 miles	(56.45)***	(19.38)	0.07	21.60
Quarterly US domestic load factor compared to quarterly average prices per 900 miles	45.03***	6.55	0.32	3.75
Quarterly US carrier passenger miles compared to quarterly average prices per 900 miles	77.19***	2.17	0.17	19.41

1997). Another scenario involves offering a number of pricing options. "By offering a limited number of seats at these lowest fares, established airlines can at least appear to be competitive in price with the new entrants" (Belobaba, 1987). This would permit increasing fares for one customer base while reducing them for another.

With regard to the second hypothesis considered, H_2: During the study timeframe, both the load factors and passenger miles increase, the results are more definitive. Even as real airfare increased during the study time frame, the load factors increased further as confirmed by the results in case 3. The US carrier passenger miles increased even more so than the load factors as confirmed by the results in case 4. These results are good news for the airlines and shows good business trends in the industry.

"Because load factor is an important measure of the efficiency of equipment utilization, this statistic makes clear that efficiency improvements flowing from deregulation continue" (Brown, 2014). Continued improvements may seem like marginal gains, but continued focus on these items will drive further business development. "The realization that effective yield management can increase revenues dramatically has prompted most airlines to consider improvements to virtually every aspect of the seat inventory control process" (Belobaba, 1987).

As stated above, case 2 confirmed a reduction in airfares when adjusted for inflation. During the same time frame, the passenger miles increased. This is a similar dynamic to the first 10 years after airline deregulation when airfares fell when adjusted for inflation and passenger travel increased more than 85% (Pinkham, 1999). "Heightened competition and more knowledge about substitute flights increase consumer price elasticity and intensify the downward pressure on fares" (Rubin and Joy, 2005). With regard to marginal utility of travel, "utility can be expected to increase—so will the passenger demand—with an extra mile traveled as long as net returns from air travel exceed that of by other modes" (Bhadra, 2003).

The research question for this study is: After the US airline mergers, did domestic airfares increase? Based on the research methods in this study and the significance of the results, a confirmation of the hypothesis is warranted. Overall, the real prices of airfares increased during the study time frame. Load factors and passenger miles increased as well showing that industry utilization and customer demand is up despite the somewhat modest increase in airfares.

A deeper look into the average domestic airline itinerary fares by origin city reveals that not all of the origins experienced the same fare increases (BTS, 2017a). When comparing origins with the number of travelers in Q4 2016, the top 20 origins account for 50% of the number of passengers while the remaining 355 origins account for the remaining 50% of passengers. This analysis includes only those origins that existed in Q4 2002 and Q4 2016 and exclude all Hawaii origins because their dynamics are substantially different than the US network.

The weighted average nominal airfare increase for the top 20 origins was 3.60% while the weighted average airfare increase for the bottom 355 origins excluding Hawaii was 17.88%. The overall weighted average airfare increase for all total origins excluding Hawaii was 10.73%. The overall US system fare increase including Hawaii was 13.50%. When adjusted for inflation, the top 20 origins were at −22.28% while the bottom 355 origins were at −11.57%. The overall US network excluding Hawaii was at −16.93% while the US network including Hawaii was at −14.86%.

The weighted average airfare increase for the eight origins in Hawaii was 203.88% and when adjusted for inflation, it was at 127.96%. The dynamics relating to Hawaii point to a lack of alternative travel modes at the largest origin in Hawaii and to a lack of competition on the smaller origins in Hawaii. "Road and rail travel become less of a substitute for air travel as distance increases; consequently, firms have greater latitude for the exercise of market power on longer routes" (Kim and Singal, 1993). Table 4 shows the price increases between 2002 and 2016 from Bureau of Transportation Statistics, U.S. Department of Transportation, National-Level Domestic Average Fare Series (BTS, 2017a).

The difference in airfare increases between the top 20 origins and the bottom 355 origins confirm that less competition is enhanced with more competitors. The increases at the smaller origins were approximately five times larger than the increases at the larger origins. These smaller origins would have fewer competitors which would permit more pricing power by those competitors (Kim and Singal, 1993). This explains the phenomena that the airfare increase in the top 20 origins was 3.60% while the remaining origins were at 17.88%.

In addition to having less competition at the smaller origin markets, the long term commercial viability of these markets may be suspect as well. The smaller communities which were at least 100 nautical miles (or 161 km) from a hub airport saw more than 26% of these airports close and the remaining airports saw more than a 9% loss

Table 4: Comparison of airfares

Average domestic airline fares by origin	Percentage size	Non Hawaii percentage	Weighted average price increases	Weighted average price increases+inflation
Top 20 origins (excluding Hawaii)	49.37%	50.09%	3.60%	−22.28%
Bottom 355 origins (excluding Hawaii)	49.19%	49.91%	17.88%	−11.57%
Total 375 origins (excluding Hawaii)	98.57%	100%	10.73%	−16.93%
Hawaii origins	1.43%	0	203.88%	127.96%
Total origins	100.00%	98.57%	13.50%	−14.86%

of capacity between 1978 and 1998 (Jones, 1998). One potential result of the smaller origins having larger airfare increases would be because of "fortress hubs" where a limited number of airlines handle the origin traffic and exercise greater market power in these locations (Brown, 2014). The pricing dynamics between 2002 and 2016 seen in the smaller origins is an example of this dynamic.

5. CONCLUSIONS

The purpose of this study is to briefly review the airline industry market concentration and profitability given the mergers which occurred in the last 10 years and evaluate whether the airline industry raised airfares during the study time frame. Given the increased market power, it is not surprising that airfares increased during the study time frame, even though the increase was fairly moderate and when adjusted for inflation, the airfares actually decreased.

These results are in line with other studies which document pricing power connected to increased industry concentration (Chen et al., 1989; Kim and Singal, 1993). Other studies document decreasing airfares during certain periods which generated a substantial increase in passenger travel (Pinkham, 1999); having the ability to easily switch airlines before ticket purchasing (Das and Reisel, 1997); and providing various pricing alternatives to allow more budget travelers (Belobaba, 1987). These flight substitutions can provide "downward pressure on fares" (Rubin and Joy, 2005).

Seeing both the increases in load factor utilization and number of passenger miles shows the continued strength of the airline industry. Load factor improvements relative to the airfare increases during the study time frame show efficiency gains by the airlines (Brown, 2014) with further focus in this area as effective seat management (Belobaba, 1987). The smaller increases in airfares at the larger origins is not surprising, and is a result of having less competitors in the smaller origins relative to the larger origins (Kim and Singal, 1993; Brown, 2014). Given the potential continued decline in traffic at some of the smaller origins, there is a viability risk at some of these smaller origins that does not exist in the major hubs.

REFERENCES

Air Transport Association. (2017), A4A Passenger Airline Cost Index (PACI). Available from: http://www.airlines.org/dataset/a4a-quarterly-passenger-airline-cost-index-u-s-passenger-airlines. [Last retrieved on 2017 Oct 17].

Bailey, E., Graham, D., Kaplan, D. (1985), Deregulating the Airlines. Cambridge: Mass., MIT Press.

Bateman, C., Westphal, A. (2011), Investigating the presence of transfer pricing and its impact in U.S. airline mergers. Academy of Marketing Studies, 15(1), 45.

Belobaba, P. (1987), Survey paper-airline yield management an overview of seat inventory control. Transportation Science, 21(2), 63-73.

Bennett, R., Craun, J. (1993), The Airline Deregulation Evolution Continues: The Southwest Effect. Washington, DC: Office of Aviation Analysis, U.S. Department of Transportation.

Bhadra, D. (2003), Demand for air travel in the United States: Bottom-up econometric estimation and implications forecasts by origin and destination pairs. Journal of Air Transportation, 8(2), 19-56.

Brown, J. (2014), Jimmy carter, Alfred Kahn, and airline deregulation: Anatomy of a policy success. Independent Review, 19(1), 85.

BTS. (2017a), Bureau of Transportation Statistics. Washington, D.C: U.S. Department of Transportation, National-Level Domestic Average Fare Series. Available from: https://www.transtats.bts.gov/AverageFare. [Last retrieved on 2017 Aug 17].

BTS. (2017b), Bureau of Transportation Statistics. Washington, D.C: U.S. Department of Transportation, Air Carrier Financial: Schedule. p1.2. Available from: https://www.transtats.bts.gov/Oneway.asp?Field_Desc=98990%20-%20Net%20Income%2C%20Profit%20or%20Loss%20%28-%29%20%28000%29&Field_Type=Num&Sel_Cat=QUARTER&Lookup_Table=&Sel_Var=NET_INCOME&Sel_Stat=Sum&Data_Type=CONT&Percent_Flag=0&Display_Flag=0. [Last retrieved on 2017 Aug 12].

BTS. (2017c), Bureau of Transportation Statistics. Washington, D.C: U.S. Department of Transportation, Air Carrier Financial: Schedule. p1.2. Available from: https://www.transtats.bts.gov/Oneway.asp?Field_Desc=49990%20-%20Total%20Operating%20Revenues%20%28000%29&Field_Type=Num&Sel_Cat=QUARTER&Lookup_Table=&Sel_Var=OP_REVENUES&Sel_Stat=Sum&Data_Type=CONT&Percent_Flag=0&Display_Flag=0. [Last retrieved on 2017 Aug 12].

BTS. (2017d), Bureau of Transportation Statistics. Washington, D.C: U.S. Department of Transportation, Load Factor (Passenger-Miles as a Proportion of Available Seat-Miles in Percent (%) All Carriers. Available from: https://www.transtats.bts.gov/Data_Elements.aspx?Data=5. [Last retrieved on 2017 Aug 09].

BTS. (2017e), Bureau of Transportation Statistics. Washington, D.C: U.S. Department of Transportation, Revenue Passenger-miles (The Number of Passengers and the Distance Flown in Thousands (000)) All Carriers. Available from: https://www.transtats.bts.gov/Data_Elements.aspx?Data=3. [Last retrieved on 2017 Aug 10].

BTS. (2017f), Bureau of Transportation Statistics. Washington, D.C: U.S. Department of Transportation, National-Level Domestic Average Fare. Available from: https://www.rita.dot.gov/bts/airfares/national/table. [Last retrieved on 2017 Aug 06].

Chen, K., Hite, G., Cheng, D. (1989), Barriers to entry, concentration, and Tobin's Q Ratio. Quarterly Journal of Business and Economics, 28(2), 32.

Congress. (1978), S.2493 - Airline Deregulation Act of the 95th Congress (1977-1978). Available from: https://www.congress.gov/bill/95th-congress/senate-bill/2493. [Last retrieved on 2017 Aug 23].

Cook, W. (1995), The Take Off in the Small Plane Market after Years in the Ground, The Industry Looks Up. U.S. News and World Report, Aug. 21, 50.

Crain, A. (2007), Fort, carter, and deregulation in the 1970s. Journal on Telecommunications and High Technology Law, 5, 413-448.

Das, T., Reisel, W. (1997), Strategic marketing options in the U. S. airline industry. International Journal of Commerce and Management, 7(2), 84-98.

Evans, W., Kessides, I. (1994), Living by the "Golden Rule": Multimarket contact in the U. S. airline industry. The Quarterly Journal of Economics, 109(2), 341-366.

Harwell, D., Ashley 3rd H., Moore, T. (2015), Justice Department Investigating Potential Airline Price Collusion. Washington Post. p1. Available from: http://www.washingtonpost.com/business/economy/dojinvestigating-potential-airline-collusion/2015/07/01/42d99102-201c-11e5-aeb9-a411a84c9d55_story.html. [Last retrieved on 2017 Oct 17].

Helleloid, D., Nam, S., Schultz, P., Vitton, J. (2015), The U.S. airline industry in 2015. Journal of the International Academy for Case Studies, 21(5), 113.

Jelveh, Z. (2008), Flying on Empty. Available from: http://www.portfolio.com/newsmarkets/national-news/portfolio/2008/06/04/Airlmes-sn. [Last retrieved on 2017 Jul 25].

Jones, J. (1998), Twenty years of airline deregulation: The impact on outlying small communities. Journal of Transportation Management, 9, 91-101.

Kaplan, D., Dayton, M. (1988), Policies for the Deregulated Airline Industry, Congressional Budget Office. Available from: http://www.cbo.gov/ftpdocs/55xx/doc5541/doc02b. [Last retrieved on 2017 Aug 23].

Kim, E., Singal, V. (1993), Mergers and market power: Evidence from the airline industry. The American Economic Review, 83(3), 549-569.

MIT. (2017), Total System Load Factor Percentage. Available from: http://www.web.mit.edu/airlinedata/www/2016%2012%20Month%20Documents/Traffic%20and%20Capacity/System%20Total/Total%20System%20Load%20Factor.htm. [Last retrieved on 2017 Aug 23].

Morrison, S., Winston, C. (1995), The Evolution of the Airline Industry. Washington, D.C: Brookings Institute.

Ollinger, M. (1994), The limits of growth of the multidivision firm: A case study of the U.S. Oil industry from 1930-1990. Strategic Management Journal, 15, 503-520.

Pinkham, R. (1999), European airline deregulation: The great missed opportunity? The SAIS Europe Journal, April 1. Available from: http://www.saisjournal.org/posts/european-airline-deregulation. [Last retrieved on 2017 Aug 23].

Prince, J., Simon, D. (2017), The impact of mergers on quality provision: Evidence from the airline industry. The Journal of Industrial Economics, 65(2), 235-468.

Rhoades, S. (1993), The Herfindahl-Hirshman Index. St. Louis: The Federal Reserve Bank. Available from: https://www.fraser.stlouisfed.org/files/docs/publications/FRB/pages/1990-1994/33101_1990-1994.pdf. [Last retrieved on 2017 Jul 18].

Rubin, R., Joy, J. (2005), Where are the airlines headed? Implications of airline industry structure and change for consumers. The Journal of Consumer Affairs, 39(1), 215.

Sorkin, A., Bailey, J. (2008), Northwest and Delta Talk Merger. Available from: http://www.nytimes.com/2008/02/07/business/07air.html. [Last retrieved on 2017 Oct 19].

USA Today. (2006), Timeline of United Airlines' Bankruptcy. Available from: http://www.usatoday30.usatoday.com/travel/flights/2006-02-01-united-timeline_x.htm. [Last retrieved on 2017 Oct 17].