



The evolution of low-cost Carrier operational strategies pre- and post-recession



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ARTICLE INFO

Keywords:

Market share
Competition structures
Low-cost carriers
CONUS-Domestic markets

ABSTRACT

This study presents an analysis of low-cost carrier (LCC) competition strategies for Continental US (CONUS) domestic markets. Using OAG schedule data from 2005 to 2015, pre- and post-recession trends in LCC flight offerings were analyzed and compared with their major carrier counterparts in terms of number of markets served, flight frequency, and competition structures of served markets. Results show that LCCs are increasing the number of markets served to/from large airports and are entering highly-competitive markets. The results further suggest that LCCs and major carrier strategies evolved differently during the study period, where LCCs outpaced major carriers in terms of markets entered while major carriers have gained a greater flight frequency share in the markets they already serve. Results clearly indicate that overall LCCs are still growing in terms of O-D markets served and increasing competition with major carriers. However, evidence suggests that each of the top four LCCs adopted different operating strategies as part of their business model during the study period.

1. Introduction

In the past two decades, LCCs have become an increasingly popular alternative to air travel consumers by providing a cost-effective option to price-sensitive customers. According to the [Bureau of Transportation Statistics \(2016\)](#), the share of passengers carried by network carriers declined from 62.0% to 50.2% between 2003 and 2015 whereas the share of LCCs' passengers has been increasing. This shift in demand to LCCs has been seen even in Europe where low-cost flights increased by 61% from 2007 to 2016 while traditional carriers' flights declined by 10% during the same time period ([Eurocontrol, 2017](#)).

In the United States, much of the initial growth in popularity of LCCs was generated after the 2001 downturn, with LCCs winning over major carrier customers through offering reduced fares and creating new demand that was not satisfied by the existing airline service ([Franke and John, 2011](#)). Specifically, LCCs were able to generate new demand from infrequent price-sensitive fliers by offering them no-frills reduced fare flights ([Maidenberg, 2017](#)) as well as attract passengers who were willing to drive to nearby airports served by LCCs to benefit from their services ([Spitz et al., 2015](#)). As LCCs increasingly competed on overlapping markets with network carriers, the latter were forced to respond by implementing new business strategies ([Pearson et al., 2015](#); [Babić and Kalić, 2018](#)). One strategy included network carriers establishing low-cost carrier offshoots or what is also known as the “no frills”

divisions within the airline such as Song by Delta in 2003 and Ted by United in 2004. However, major carriers were unsuccessful in their attempts to respond to rising competition from LCCs through these offshoots as they were unable to reduce their unit costs to Southwest levels ([Morrell, 2005](#)). Consequently, airline divisions Song and Ted ceased operations by 2006 and 2009, respectively ([Pearson and Merkert, 2014](#)).

Much has been hypothesized about the operational future of LCCs and how they compete with major carriers in recent literature. For example, [Abda et al. \(2012\)](#) predicted the unconstrained growth of LCCs in the top 200 US airports was approaching an end by stating, “The well-known impacts of LCCs on air travel markets of lower average fares and higher passenger volumes are evident over the entire period of our study from 1990 to 2008. However, several more specific trends suggest that the unbridled growth of LCCs in US domestic markets may be ending.” Similarly, [de Wit and Zuidberg \(2012\)](#) predicted a slowdown to LCC growth in the upcoming years in face of route density problems and continental market saturation. They hypothesized that for future growth, LCCs will need to adopt new business strategies such as shifting operations to primary airports and creating new alliances. This was further discussed in [Dobruszkes et al. \(2017\)](#), which found that LCCs are increasingly competing from major airports while continually growing and expanding. Hence, “the largest cities' traditional airports will not be sanctuaries for traditional airlines anymore” as direct

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competition between low-cost carriers and major carriers is increasing.

The purpose of this study is to analyze the evolution in LCC operations and competitive strategies as they have gained popularity compared with their major carrier counterparts. This study contributes to literature as it is market-based (i.e. which origin-destination pair markets are served) and current literature is predominately airport-based (i.e. focuses on the origin and destination airports served). Specifically, the research questions to be addressed in this paper include 1) have LCCs altered operational strategies with regard to the markets and airports they serve and 2) have LCCs changed the competitive dynamics in which they compete (i.e. how they interact with major carriers) pre- and post-recession.¹ The rest of this paper is structured as follows: Section 2 describes the data and methodology used to study the operational evolution of LCCs over the years. Section 3 presents the analysis results for LCC competition strategies over the study period. Specifically, results are presented in three different subsections: 1) service and competition structures, 2) flight share frequency and 3) LCC presence by market size. Finally, Section 4 highlights the conclusions of this study and provides recommendations regarding the future research direction.

2. Data and methodology

To evaluate the competitive strategies of LCCs over time in comparison to their major carrier counterparts, this study utilized OAG flight schedules data, which provides carrier, flight number, origin, destination, aircraft equipment, and scheduled departure/arrival times for scheduled flights. This study uses service information indicated in the OAG schedules from 2005 to 2015 for nonstop continental US (CONUS) directional origin-destination (OD) airport markets. For example, in this study ATL-LAX and LAX-ATL were considered as two different markets. Directional OD airport markets were considered to capture markets with different market competition structure in each route direction. For example, in 2007, Southwest was the only significant operating carrier in the market departing from LAS and arriving at BUR. However, for flights departing from BUR and headed to LAS, both US Airways and Southwest Airlines competed on this route. Only non-stop service was considered as air passengers value a non-stop itinerary “up to 8 times more than a connecting itinerary” (Emrich and Harris, 2008) as well as to stay consistent with previous literature that only considered non-stop flights (e.g. de Wit and Zuidberg, 2012; Reynolds-Feighan, 2001; Spitz et al., 2015; Zhang et al., 2018). This analysis uses the third week of July for each year, which is a notably high-demand time of year, to reduce any impacts of seasonality on market offerings.

Table 1 shows the LCC and major carriers included in the analysis, which were categorized as either major or low-cost, consistent with the classification using existing literature (Abda et al., 2012; Spitz et al., 2015; USDOT, 2012). Select studies classify carriers that are not major or LCC as “Other” (Abda et al., 2012), but these carriers were outside the scope of this study as the objective is to determine how major carriers and LCCs have interacted over time.²

¹ The great recession began in December 2007 and ended in June 2009, lasting 18 months (BLS, 2012). During the first three quarters of 2008, the U.S. passenger airline industry lost \$4.3 billion mainly caused by the increase in fuel prices (GAO-09-393).

² Upon conducting a sensitivity analysis, it was found that the number of markets with significant service from a regional carrier, as defined earlier in the methodology section, is very minimal. The number of markets with significant presence by a regional carrier (at least 7 non-stop flights during the third week of July and operating flights with a seating capacity greater than 20 seats/flight) include: Great Lakes Aviation (14 markets in 2006, 2009, 2012; 6 markets in 2015), Republic Airlines (1 market in 2006), Mesaba Airlines (2 markets in 2009), Shuttle America (1 market in 2009, 2012), Penair (6 markets in 2012, 2015) and ViaAir (2 markets in 2015). Therefore, this study excludes regional carriers and only considers major and low-cost carriers in the analysis.

Table 1
Airline classification by type.

Major Carriers	Low-Cost Carriers
Alaska Airlines	Airtran Airway
American Airlines	Allegiant Air
Continental Airlines	America West Airlines
Delta Air Lines	Ata Airlines, Inc.
Northwest Airlines	Frontier Airlines Inc.
United Airlines	Independence Air
US Airways	JetBlue Airways Corporation
	Midwest Airlines Op By Republic A/L
	Southwest Airlines
	Spirit Airlines
	Sun Country Airlines
	USA 3000 Airlines
	Virgin America

In this study, an airline was considered a significant operating competitor (i.e. a probable customer choice) on a market if it operated at least 7 non-stop flights during the third week of July (i.e. an average of one a day), with an average of at least 20 seats per flight. An OD pair market was said to be served if it had at least one significant operating competitor from Table 1. It is important to note that competitors in this study were operating carriers and did not include codeshares.

In addition to using OAG Schedules, which provided market competition structures and flight frequency, airport size was incorporated into the study through the annual FAA Airport Classification (FAA, 2015).³ These classifications are based on the number of annual passenger boardings and label an airport as either large, medium, small, non-hub, or non-primary. This study classifies both primary non-hub and non-primary non-hub airports as “non-hub” and therefore any airport with less than 10,000 passenger boardings per year or less than 0.05% of annual passenger boardings fall in the same classification. The airport classification was used for each year, therefore an airport could be labeled small one year and medium the next if annual passengers increased.

3. Results

The following sections present different dimensions to LCC competition strategies in comparison to major carriers during the study period. The results include the analyses and sections in the following order: 1) market service and competition structures, 2) flight frequency, and 3) OD airport sizes.

3.1. Market service and competition structures

As a result of the recession, airlines implemented several cost-cutting strategies which included increasing load factors (Garrow et al., 2012), but they also decreased the total number of OD pair markets served within the U.S. As shown in Table 2, in 2005 there were 4656 non-stop, CONUS-domestic markets served by at least one of the airlines listed in Table 1. By 2015, the total of number of non-stop markets had decreased to 4199 (a 9.82% decrease). This decrease in markets served was not uniformly seen across all market competition structures. This is seen in Table 2, which presents the number of markets served and the year-over-year percent change in market offerings for three competition structures: 1) markets with major carrier competitors only,

³ FAA defines a primary airport as commercial service airports with more than 10,000 passenger boardings each year. Primary airports are classified as large, medium, small or non-hub. Large hub airports have 1% or more of annual passenger boardings. Medium hub have at least 0.25% of annual passenger boardings. Small hub have at least 0.05% of annual passenger boarding and non-hub have more than 10,000 annual passenger boardings. Non-Hub non-primary airports have at least 2500 annual passengers boardings (FAA, 2015).

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