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THE MODEL OF NETWORK CARRIERS' STRATEGIC DECISION-MAKING WITH LOW-COST CARRIER ENTRY

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Overview

- 1978: The U.S. Airline Deregulation Act
 - 1970s: Southwest Airlines LCC model
 - 1991: Ryanair, Ireland
 - 1995: EasyJet, U.K.

- “U.S. passenger traffic has averaged 2% annual growth since 2009.”

Boeing Market Outlook, 2014

U.S.-based LCCs

	IATA Code	Airline	Principal Hub
1	FL	AirTran Airways, TX	Hartsfield-Jackson Atlanta Intl
2	G4	Allegiant Air, NV	Las Vegas McCarran Intl
3	F9	Frontier Airlines, CO	Denver Intl
4	B6	JetBlue Airways, NY	New York John F. Kennedy Intl
5	WN	Southwest Airlines, TX	Chicago Midway Intl
6	NK	Spirit Airlines, FL	Fort Lauderdale-Hollywood Intl
7	VX	Virgin America, CA	San Francisco Intl

Source: CAPA database

Research Question

1. To investigate major carriers' competitive reaction (AA, DL, UA, US) when they face an LCC entrant in the less congested, small-sized U.S. regional airports.

- To select number of U.S.-based airports with 3-4 airlines in operation.
- To investigate airline behavior to deter or to accommodate the LCC entrant.

Axelrod's "Tit for Tat" strategy (1992)

Pricing behavior and capacity

Propositions

2. To investigate 5 indicators and their effect on the fares in the market with LCC entry.

- Stage length:
Longer routes result in higher costs and higher fares
- Number of economy class passengers:
Less passengers result in higher fares
- Number of competitors:
Less competitors result in higher fares
- Number of stops:
Fewer stops result in higher fares
- The price of oil:
Higher oil price result in higher fares

Methodology

- Stage 1: The effect of LCC entry on airlines at the selected small-sized U.S. domestic airports.
 - Quarterly air fares were collected for the airlines operating in the market one year prior to LCC entry and two years after.
- Stage 2: The influence of selected indicators on airfares with LCC entry.
 - Dependent variable: The average economy class one-way fares of airlines flying in the same market as LCC entrant.
 - Predictor variables: Stage length, # economy pax, # competitors in the same market, # of stops, and the price of oil (one year prior LCC entry and two years after).

LCCs and Secondary U.S. Airports

Airport	LCC	Entry	LCC	Entry	LCC	Majors
1. McGhee Tyson Airport, TN	AirTran	Q2 2009	Frontier	Q3 2007	2	4
2. Newport News/Williamsburg Intern Airport, VA	Frontier	Q3 2010			1	3
3. Palm Spring International Airport, CA	Frontier	Q3 2010	Virgin America	Q4 2011	2	4
4. Portland International Airport, OR	JetBlue	Q2 2006	Southwest		2	3
5. Richmond International Airport, VA	AirTran	Q2 2005	JetBlue	Q1 2006	2	4
6. Sarasota Bradenton International Airport, FL	JetBlue	Q4 2006			1	4
7. Westchester County Airport, NY	AirTran	Q2 2006	JetBlue	Q1 2007	2	4
8. Atlantic City International Airport, NJ	AirTran	Q2 2009	Spirit		2	1
9. Capital Region International Airport, MI	Frontier	Q4 2013	Sun Country	Q4 2010	2	2
10. McAllen Miller International Airport, TX	Allegiant	Q3 2005			1	2

Research Method

- Data collection:
 - *masFLIGHT*, the subscription database
 - WTI Cushing Oklahoma oil, the U.S. Department of Energy
- Which specific independent variables make meaningful contributions to the overall prediction of the model (airfares)?
 - Stepwise multiple regression with backward elimination

Stage 1 Results

- There were no specific patterns discovered in airline behavior in a market with LCC entry.
- While some airlines decreased their fares in the first year following the LCC entrant, other airlines demonstrated fare increases.
- No pattern was discovered in the second year of operation as well.
- Additionally, the LCC itself demonstrated either fare increases or decreases in the second year of operation.

Limitations

- The average market airfares will not correctly reflect airline behavior because airlines are competing on the individual routes.
 - Seasonality, day of the week and time of the flight also play a large role in airline revenue management.
- *masFlight* provided a 10% sample of quarterly airfares
 - The Bureau of Transportation Statistics' Passenger Origin and Destination survey

Stage 2 Results

1. An increase in the stage length (the longer the route, the higher the costs and the higher the fare).
SUPPORTED
2. A decrease in the number of passengers in economy class (less passengers result in higher fares).
SUPPORTED
3. A decrease in the number of competitors in the market (less competitors results in higher fares).
SUPPORTED

Stage 2 Results (cont.)

4. A decrease in the number of stops (the fewer the stops, the higher the fare). SUPPORTED
5. An increase in oil price (the higher the oil price, the higher the fare). MIXED RESULTS

The surprising results of negative relations came from analysis of oil price and airline fares out of two airports: McGhee Tyson Airport with AirTran Airways entry, and Westchester County Airport with AirTran Airways and JetBlue Airways entries.

Conclusion

- The first stage of research demonstrated mixed results and did not discover any patterns in airline behavior with LCC entry due to a large number of other variables influencing airline revenue management.
- The second stage confirmed that the stage length, # pax, # of competitors, and # of stops (with the exception of the oil price) had an impact on airfares for airlines operating out of small regional airports.

Target Deliverables

- Presentation: The Air Transport Research Society World Conference 2016
- Publications: transportation research peer-reviewed journals
- External grants: The U.S Department of Transportation

“...the grants to universities across the United States to advance the state-of-the-art in transportation research and develop the next generation of transportation professionals.” (DOT, 2014)

THANK YOU!

QUESTIONS?

