

A horizontal bar consisting of a blue segment on the left and a red segment on the right.

An Assessment of Competition and Consumer Choice in Today's U.S. Airline Industry

Daniel M. Kasper and Darin Lee, Ph.D.

June 26, 2017

Summary of Findings

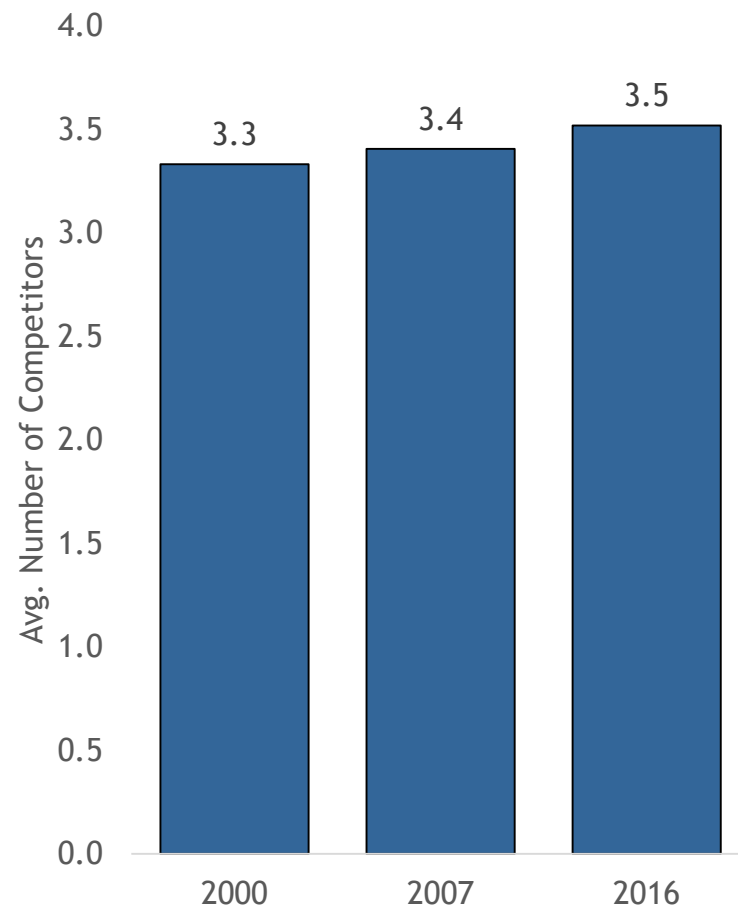
An analysis using established criteria for assessing airline industry competition demonstrates that there is robust competition in the U.S. airline industry. In particular:*

- U.S. consumers currently enjoy a wide array of choices among competing airlines and products.
- The “Southwest Effect” is alive and well and there are now several rapidly growing carriers that substantially lower fares in the markets in which they compete.
- Robust competition spurred by both the continued growth of lower cost carriers and the expansion by all carriers at competitors’ hubs has resulted in fare levels among the lowest in U.S. aviation history.
- Following external shocks that severely impeded the economics of serving small communities, service at small airports has been growing.
- Improved financial health has enabled U.S. carriers to invest heavily in their products and services, create thousands of well-paying airline jobs, and substantially increase compensation levels for airline employees.
- The U.S. airline industry’s operational performance and customer satisfaction levels are at all-time highs.

Overall, the Average Number of Competitive Choices for Air Travel Has Increased Over the Past Two Decades

- The average number of competitors per city-pair has *increased* consistently for almost two decades.
 - For example, between Cleveland and Boston, a market with over 400 passengers per day each way (“ppdew”), the number of competitors increased from two to four with the addition of two low cost carriers.
 - Similarly, between Detroit and Washington, D.C. (1,000+ ppdew), the number of competitors increased from two to five (including two low cost carriers).
- Simply put, the lack of entry barriers has made it easy for all carriers—including low cost and ultra low cost carriers—to continue entering and expanding into more city-pairs.

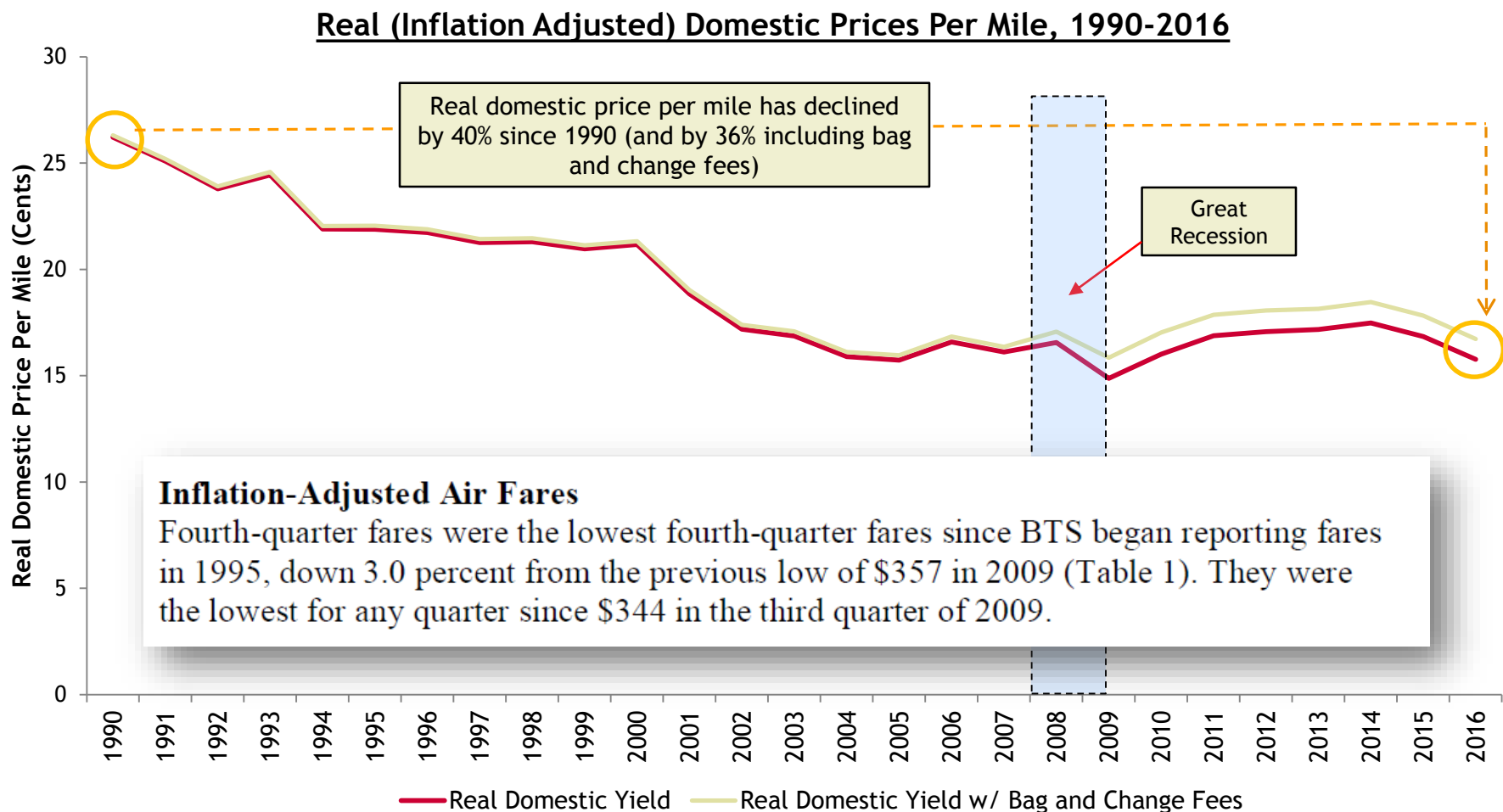
Average Number of Competitors on U.S. Domestic City-Pairs



Sources: U.S. DOT DB1B Database.

Notes: A carrier is defined as a competitor on a city-pair if it has at least 5% of O&D passengers. Average number of competitors is weighted across city-pairs by passengers. Airports in the following metropolitan areas are grouped: Chicago (ORD, MDW), Cincinnati (CVG, DAY), Cleveland (CLE, CAK), Dallas (DFW, DAL), Houston (HOU, IAH), Los Angeles Basin (LAX, BUR, LGB), Miami (MIA, FLL), New York (LGA, JFK, EWR), San Francisco/Bay Area (SFO, OAK), Washington DC/Baltimore (DCA, IAD, BWI), and Tampa (TPA, PIE).

Ticket Prices Are At or Near Their Historical Lows Notwithstanding the 110% Increase in Jet Fuel Prices Since 1998 and Several Mergers

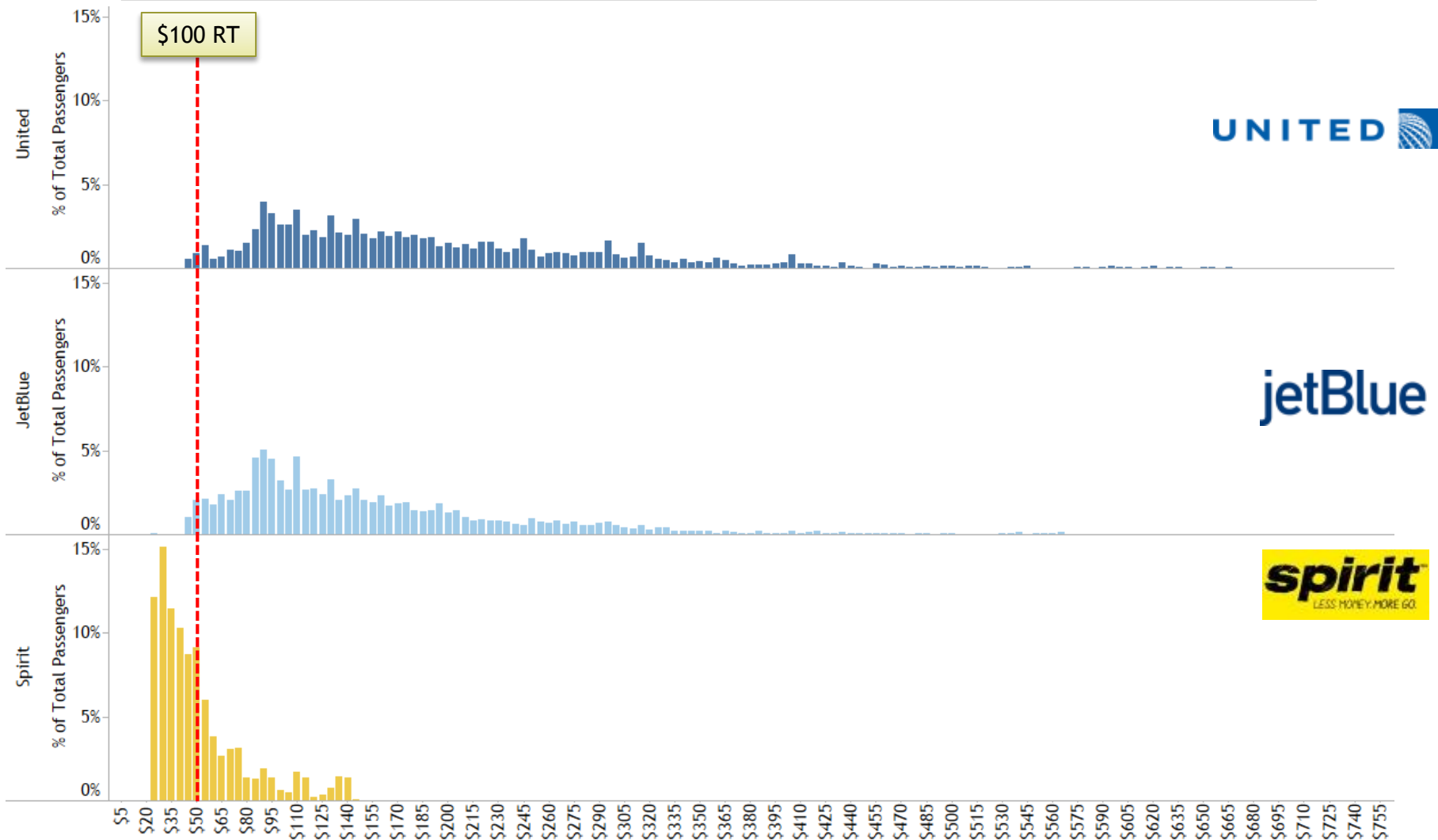


Sources: A4A; U.S. Department of Labor Bureau of Labor Statistics; U.S. EIA. U.S. DOT 4th Quarter Air Fare Data Report.

Notes: 2016 Dollars. Prices are net of taxes and passenger facility charges. Real domestic price per mile is stage-length adjusted to 1,000 miles. Bag and change fees are domestic unadjusted for distance.

In an Increasing Number of City-Pairs, Consumers Can Choose from Full Service Options on Global Network Carriers, Low Cost Options on Carriers Such as JetBlue, and Even Lower Cost Options on ULCCs Such as Spirit

Round-trip Non-Stop Base Fare (Excluding Ancillary Fees) Distribution Between Boston and Cleveland



Source: U.S. DOT DB1B Database 2016.

In Response to Strong Demand for “Unbundled” Fares Offered by ULCCs, Global Network Carriers Have Introduced “Basic Economy” Fares

UNITED United States | English MileagePlus: Sign in or join

Thu Jun 8, 2017 EWR - Liberty New York/Newark, NJ, US → ORD - O'Hare Chicago, IL, US

Economy (lowest)

Tue 6/6	Wed 6/7	Thu 6/8	Fri 6/9	Sat 6/10
\$210	\$210	\$166	\$166	\$166

Fares are each-way, per person, based on a roundtrip purchase and include taxes and fees. Additional bag charges may apply.

50K Bonus Miles + \$50 statement credit

Basic Economy (most restricted) Economy Economy (flexible) First (2-cabin, lowest)

Depart	Arrive	Stops	Duration	Basic Economy (most restricted)	Economy	Economy (flexible)	First (2-cabin, lowest)
5:15 am	6:40 am	Nonstop	2h 25m	\$166 Select	\$181 Select	\$441 Select	\$310 Select
8:30 am	9:52 am	Nonstop	2h 22m	\$166 Select	\$181 Select	\$441 Select	\$411 Select
9:05 am	10:30 am	Nonstop	2h 25m	\$166 Select			

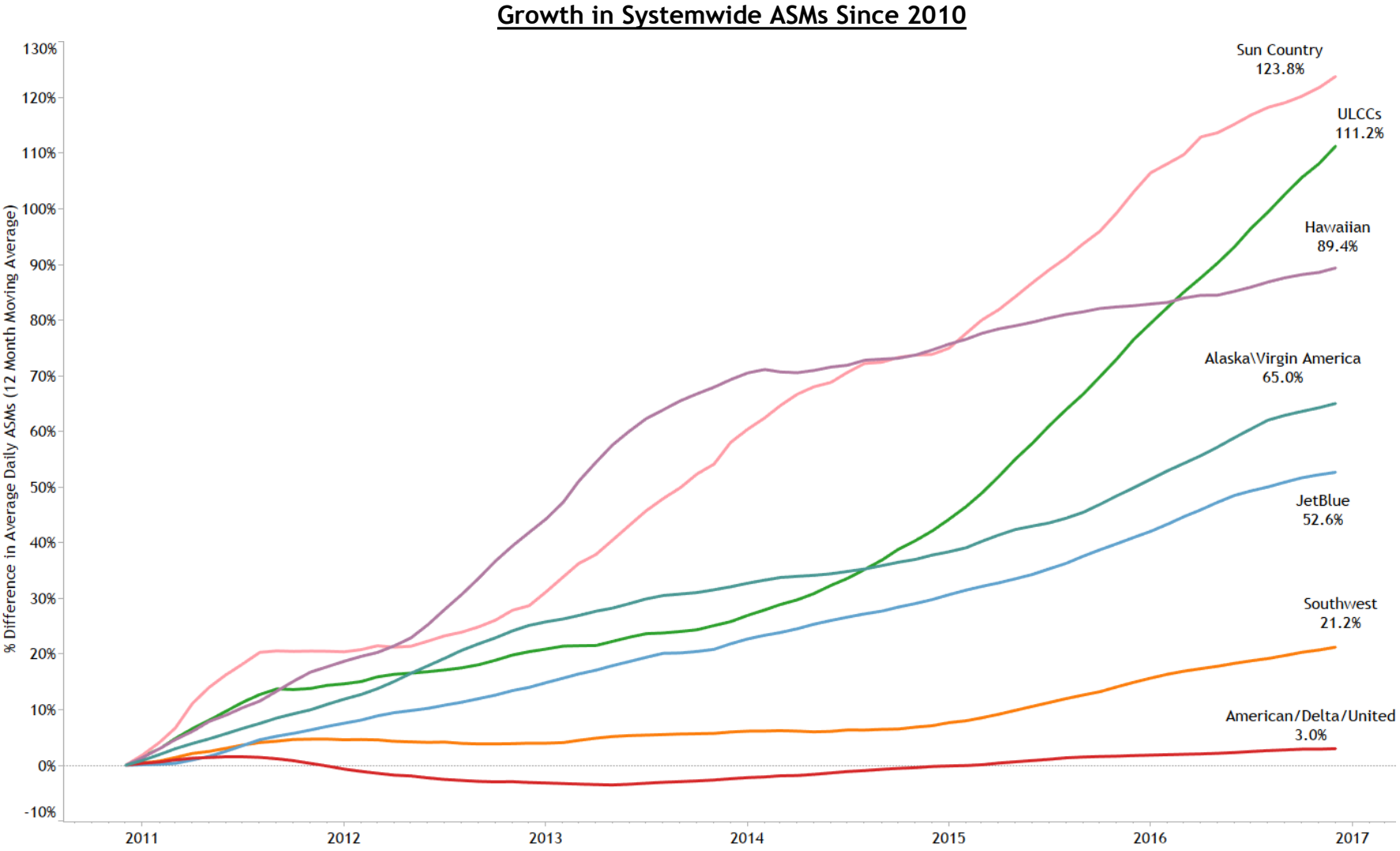
Please confirm that Basic Economy fits your travel

	Basic Economy (most restricted)	Economy
Choose, change or upgrade seats ¹	✗	✓
Sit with your group or family ¹	✗	✓
Bring a full-sized carry-on bag on board ²	✗	✓
Change your flight ³	✗	✓
Earn Premier® qualifying credit and lifetime miles	✗	✓

Basic Economy works for me

Source: United.com accessed on June 1, 2017 for outbound travel on June 8, returning on Tuesday June 12th. Lowest return fares priced at \$166 (Basic Economy) on 5:34 PM, 7:35 PM and 9:20 PM departures.

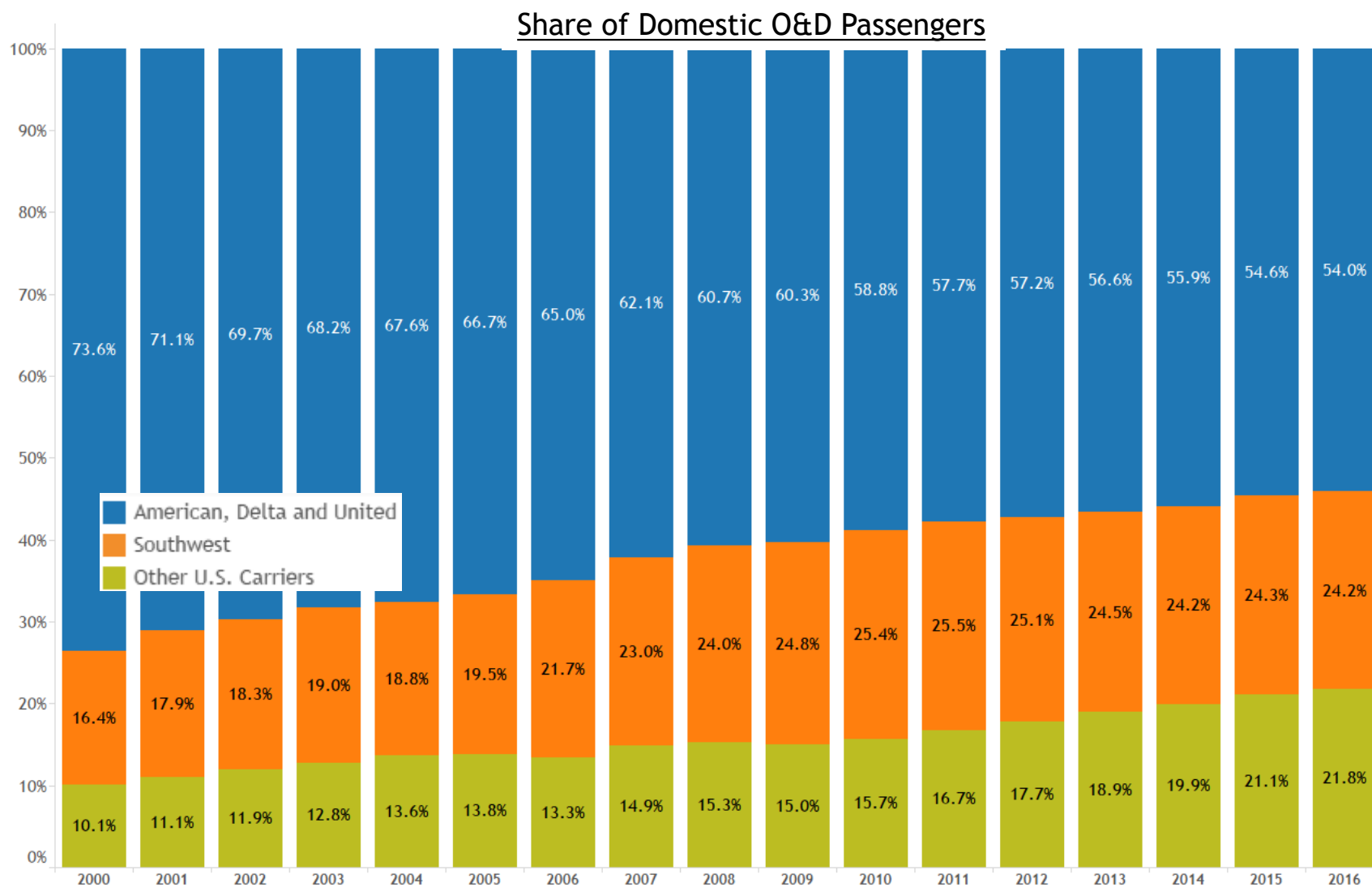
Smaller Carriers Have Been Growing Far Faster Than the Four Largest Carriers



Source: OAG.

Notes: ULCCs include Allegiant, Spirit and Frontier. Carriers include predecessor airlines.

Smaller Carriers (Alaska, Spirit, JetBlue, etc.) Have Been Growing Rapidly

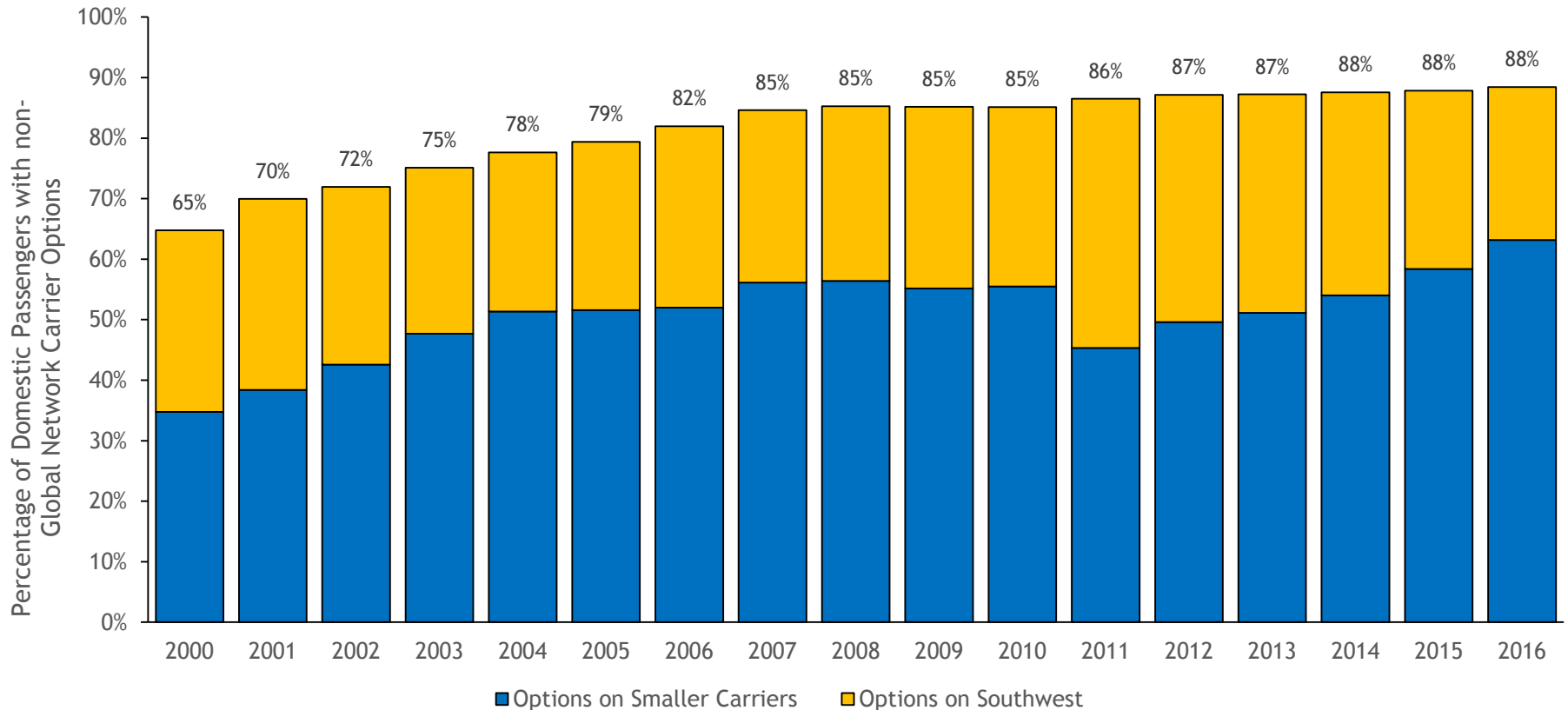


Sources: U.S. DOT DB1B.

Notes: American, Delta, United and Southwest reflect merged carriers in all years.

Consumers' Options to Choose from Carriers Other Than the Global Network Carriers Have Increased Significantly Over the Past Two Decades

Proportion of Domestic O&D Passengers Traveling in City-Pairs With Options Other Than American, Delta or United



Sources: U.S. DOT DB1B.

Notes: Domestic passengers. Global Network Carriers includes American, Delta, United, and their predecessors. Passengers with non-Global Network Carrier options are passengers on city-pairs where at least one non-Global Network Carrier has at least a 5% O&D passenger share. Airports in the following metropolitan areas are grouped: Chicago (ORD, MDW), Cincinnati (CVG, DAY), Cleveland (CLE, CAK), Dallas (DFW, DAL), Houston (HOU, IAH), Los Angeles Basin (LAX, BUR, LGB), Miami (MIA, FLL), New York (LGA, JFK, EWR), San Francisco/Bay Area (SFO, OAK), Washington DC/Baltimore (DCA, IAD, BWI), and Tampa (TPA, PIE).

The Assertion That “The ‘Southwest Effect’ is Long Gone” Has Been Proven to Be Untrue



- Some industry observers have asserted that since its merger with AirTran “The ‘Southwest Effect’ is Long Gone.”*
- Such statements are unfounded and have been directly refuted by published research.
- A recent update of a frequently cited study by Prof. Jan Brueckner, Dr. Darin Lee and Dr. Ethan Singer (known as the “BLS study”**) demonstrates that the Southwest Effect on fares is alive and well.

*See, e.g., “Broadening the Lens on Investigating Potential Collusion in the U.S. Airline Industry”, The American Antitrust Institute, September 22, 2015. **Jan Brueckner, Darin Lee and Ethan Singer, *Economics of Transportation*, Vol. 2 (1), 2013, pp. 1-17.

Rigorous Econometric Analysis Demonstrates That a Number of Carriers—Including Southwest—Put Substantial Downward Pressure on Fares

- An update of the BLS model demonstrates that, in 2016, Southwest’s presence on a route lowered fares by more than 21%.
- The decline in the Southwest Effect in recent years is primarily attributable to:†
 - Rapid growth of other LCCs and ULCCs which has lowered overall market fares nationally.
 - Southwest’s strategy of selling “bundled” fares while other carriers adopt varying degrees of the “unbundled” strategy (i.e., charging separately for ancillary services such as checked bags, pre-selected seats, overhead space, etc.).
 - Southwest’s success in capturing a larger share of higher yielding business passengers.
- The results shows that a wide range of smaller (but rapidly expanding) carriers also put substantial downward pressure on global network carrier fares, e.g.:
 - Alaska 24.0%
 - JetBlue 25.4%
 - Spirit 18.5%

	All Fares	Global Network Carrier Fares
leg_ns2	-0.0187 (0.0133)	-0.0315* (0.0154)
leg_ns3	-0.0102 (0.0329)	-0.0540 (0.0340)
D(Alaska nonstop)	-0.0944** (0.0255)	-0.240** (0.0265)
D(Southwest nonstop)	-0.217** (0.0275)	-0.212** (0.0180)
D(JetBlue nonstop)	-0.156** (0.0384)	-0.254** (0.0214)
D(Spirit nonstop)	-0.169** (0.0269)	-0.185** (0.0185)
D(Frontier nonstop)	-0.0981** (0.0233)	-0.0935** (0.0199)
D(Sun Country nonstop)	-0.106** (0.0406)	-0.0938** (0.0308)
Legacy adjacent nonstop	-0.0124 (0.0119)	-0.0347** (0.0128)
D(Alaska adjacent nonstop)	0.00167 (0.0400)	-0.0216 (0.0491)
D(Southwest adjacent nonstop)	-0.158** (0.0162)	-0.145** (0.0157)
D(JetBlue adjacent nonstop)	-0.144** (0.0261)	-0.164** (0.0270)
D(Spirit adjacent nonstop)	-0.0984** (0.0236)	-0.106** (0.0268)
D(Frontier adjacent nonstop)	-0.0573* (0.0271)	-0.0677* (0.0269)
D(Sun Country adjacent nonstop)	0.00140 (0.0366)	0.0137 (0.0404)
D(Allegiant adjacent nonstop)	-0.236** (0.0644)	-0.180* (0.0726)
ltdist	0.297** (0.0106)	0.284** (0.0115)
pop	0.00313 (0.00394)	0.00728 (0.00408)
income	0.00387** (0.00105)	0.00401** (0.00126)
tempdiff	-0.00332** (0.000527)	-0.00448** (0.000628)
Constant	3.348** (0.0744)	3.464** (0.0816)
Observations	5,668	5,576
Adjusted R-squared	0.817	0.724

†The original BLS report using data from YE-2008-Q2 found a Southwest Effect of 26.8% for All Fares. Source: Jan Brueckner, Darin Lee and Ethan Singer, “Airline competition and Domestic US Airfares: A Comprehensive Reappraisal,” *Economics of Transportation*, Vol. 2 (1), 2013, p. 7.

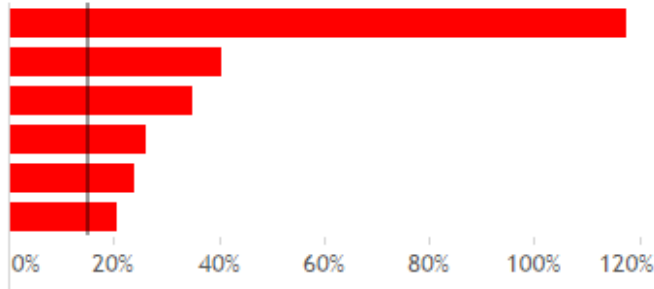
** p<0.01, * p<0.05. Carrier fixed effects, quarterly dummies and additional competition variables (connecting competition, potential competition, Virgin America presence and Allegiant nonstop) suppressed. Standard errors clustered by market in parentheses. Dependent variable: FYE 2016-Q2 natural log of fares.

The Four Largest U.S. Carriers Aggressively Compete Against One Another-Including at Each Others' Hubs

% Capacity Growth By the Four Largest U.S. Carriers at Other Carriers' Hubs/Focus Cities, 2010 to 2017*

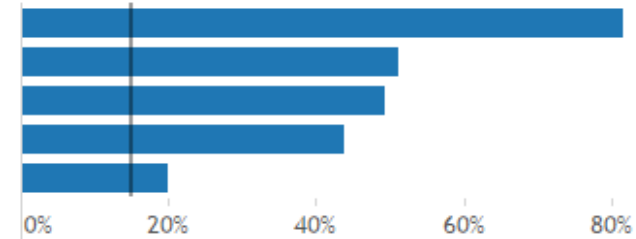


U.S. GDP Growth



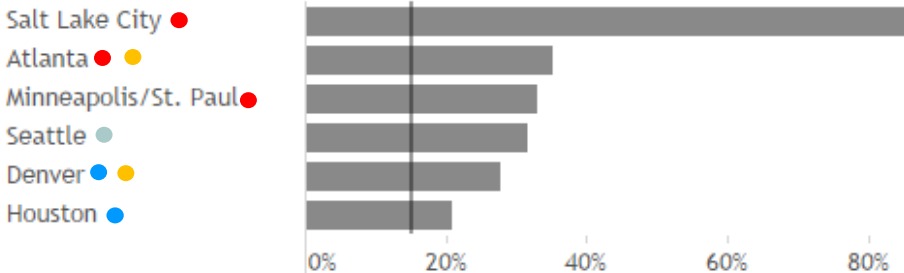
U.S. GDP Growth

Competitors' Hub Cities



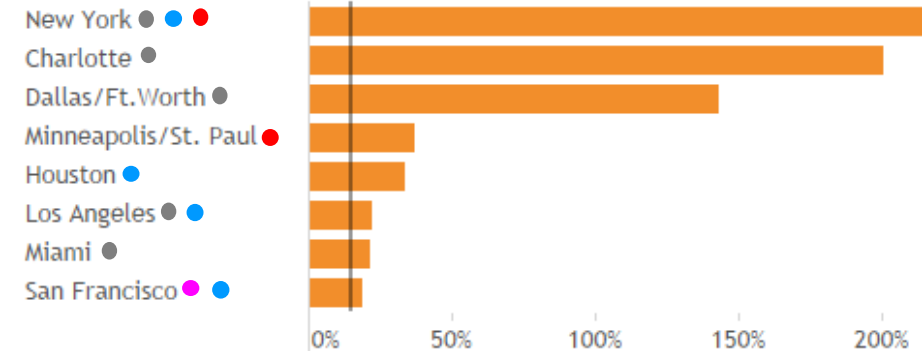
U.S. GDP Growth

Competitors' Hub Cities



U.S. GDP Growth

Competitors' Hub Cities

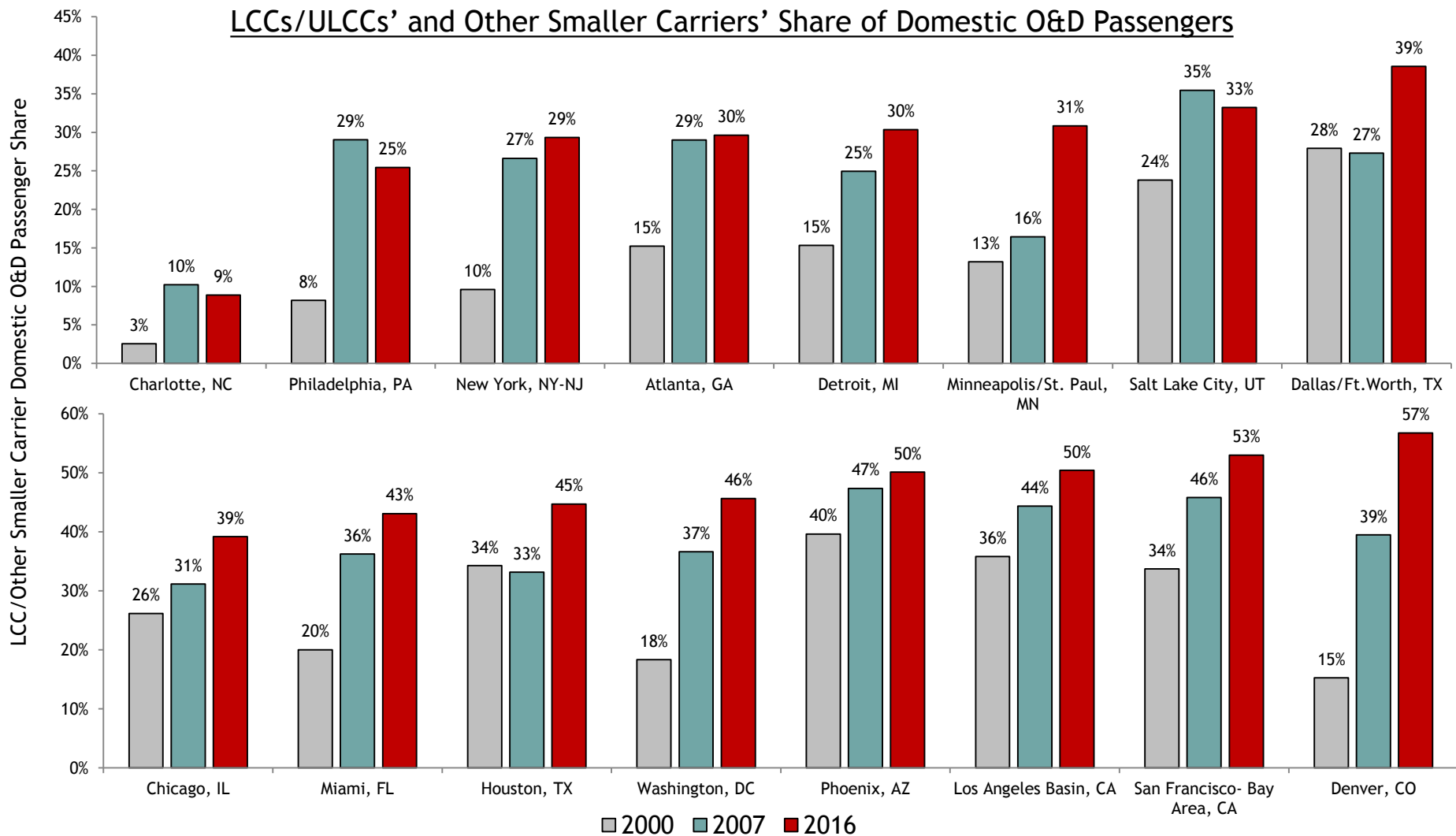


- American Hub
- United Hub
- Delta Hub
- Southwest Focus City
- Alaska Hub
- Virgin America Hub

Source: OAG, World Bank.

Notes: *Capacity measured by ASMs. Airports in the following metropolitan areas are grouped: Chicago (ORD, MDW), Dallas (DFW, DAL), Houston (HOU, IAH, EFD), Los Angeles Basin (LAX, BUR, LGB), Miami (MIA, FLL), New York (LGA, JFK, EWR), San Francisco Bay Area (SFO, OAK), and Washington DC (DCA, IAD, BWI). Growth in real U.S. GDP from 2010 to 2017 using World Bank forecasts.

LCCs and Other Smaller Carriers Have Grown Rapidly at U.S. Global Network Carriers' Hub Cities and Now Carry a Significant Share of Passengers at Those Cities

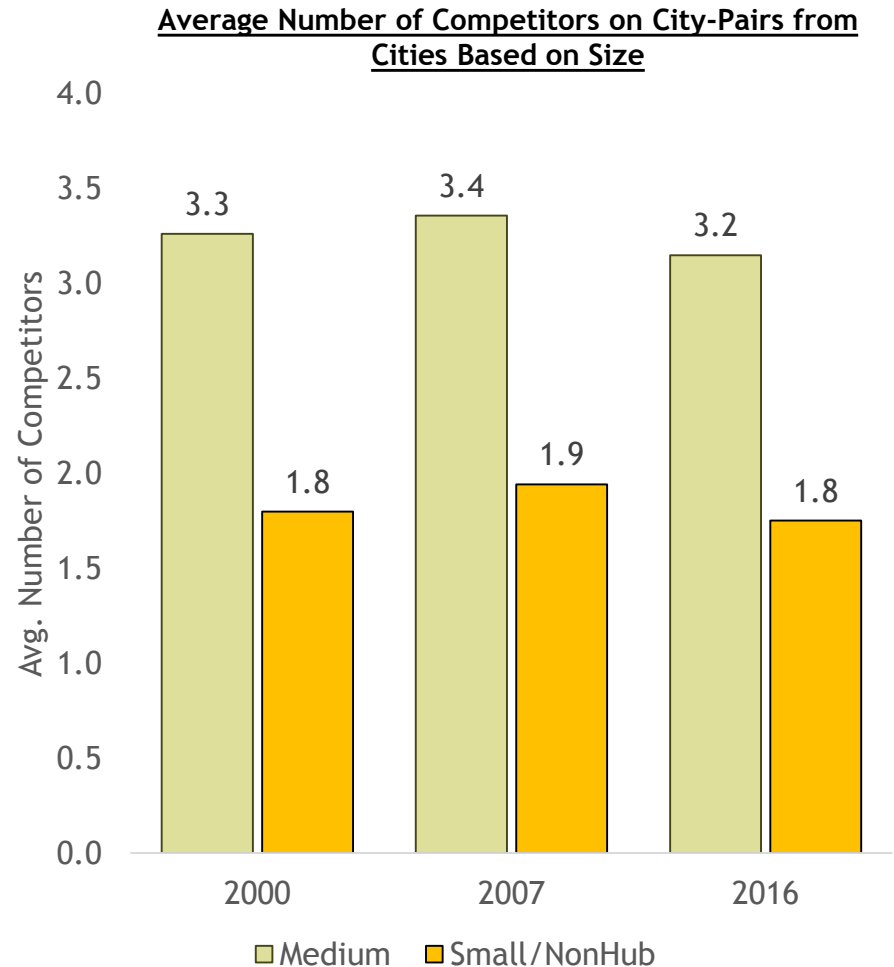


Source: U.S. DOT DB1B.

Notes: Share of domestic O&D passengers on U.S. carriers other than American, Delta, United, and predecessor carriers. Airports in the following metropolitan areas are grouped: Chicago (ORD, MDW), Dallas (DFW, DAL), Houston (HOU, IAH, EFD), Los Angeles Basin (LAX, BUR, LGB), Miami (MIA, FLL), New York (LGA, JFK, EWR), San Francisco Bay Area (SFO, OAK), and Washington DC (DCA, IAD, BWI).

Consumers in Small- and Medium-Sized Communities Continue to Have Competitive Choices, Notwithstanding the Reductions in Service At Some Cities

- Although the challenges of providing service to small communities resulted in some airports experiencing a reduction in service over the past decade, passengers in all but the smallest communities (i.e., those with insufficient demand to support multiple carriers) still benefit from competitive choice.
- For example, the average city-pair to/from small cities still has close to two competitors and passengers using small cities are increasingly benefitting from service on larger 76-seat regional jets with Wi-Fi, First Class, Premium Economy, etc.

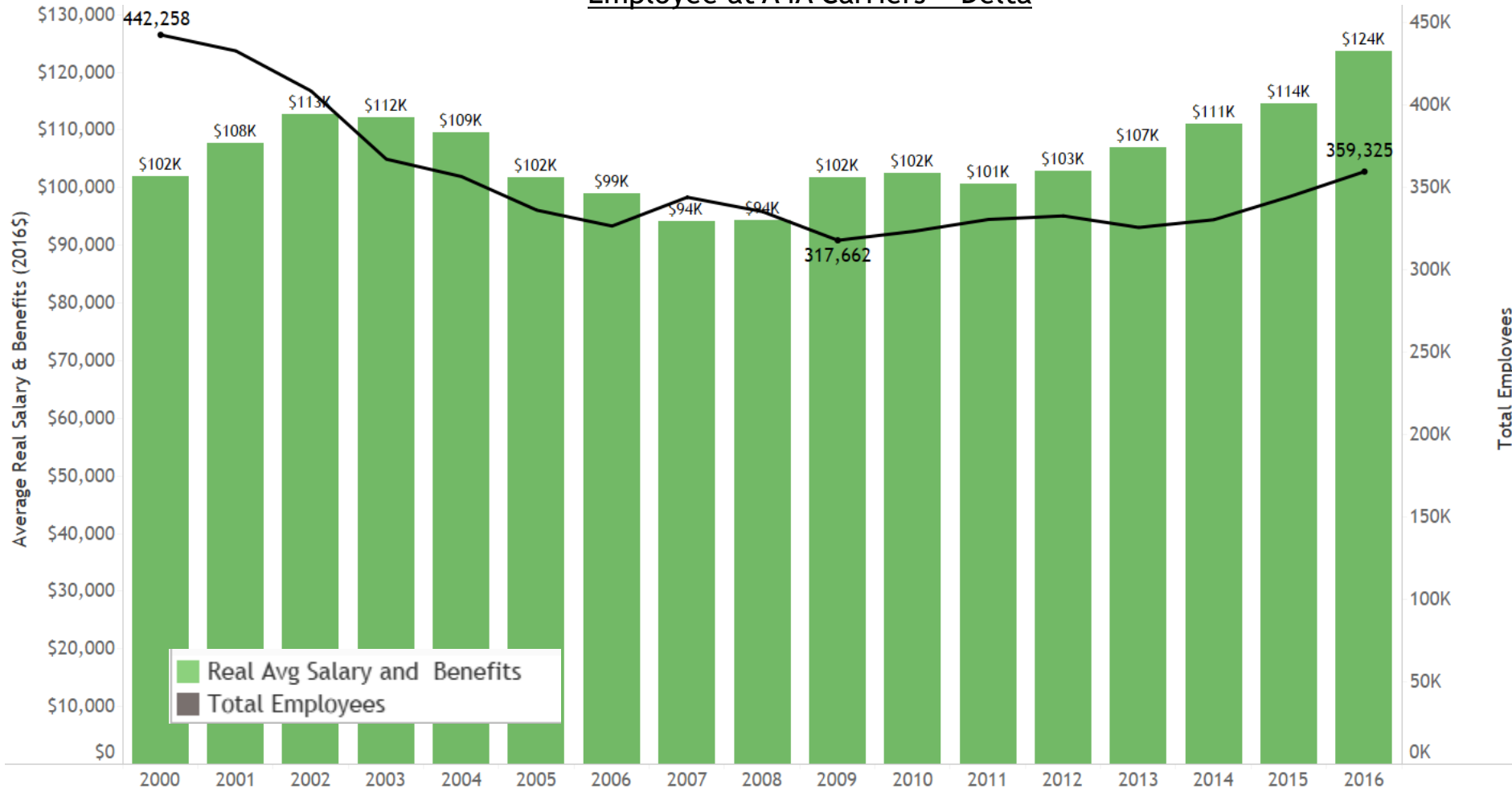


Sources: U.S. DOT DB1B Database; T100; FAA (https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/categories/).

Notes: Bars show average number of competitors per city-pair where one end of each city-pair includes cities in that size category (based on 2007 enplanements). A carrier is defined as a competitor on a city-pair if it has at least 5% of O&D passengers. Average number of competitors at each city is computed as the passenger-weighted average of competitors on all city-pairs from that city. Average number of competitors for each city size is calculated as the simple average across cities in a size category. City categories are based on 2007 enplanements with: Large Cities greater than 1% of U.S. enplanements, Medium Cities greater 0.25% of U.S. enplanements, Small/Nonhub less than 0.25% of U.S. enplanements and more than 10,000 annual enplanements. Size cutoffs based on FAA airport size definitions. The following airports are grouped into cities: Chicago (ORD, MDW), Cincinnati (CVG, DAY), Cleveland (CLE, CAK), Dallas (DFW, DAL), Houston (HOU, IAH), Los Angeles Basin (LAX, BUR, LGB), Miami (MIA, FLL), New York (LGA, JFK, EWR), San Francisco/Bay Area (SFO, OAK), Washington DC/Baltimore (DCA, IAD, BWI), and Tampa (TPA, PIE). All other cities are individual airports.

After Shedding Over 120,000 Mainline Jobs Between 2000 and 2009, a More Profitable U.S. Airline Industry Has Restored Employment and Compensation Growth for U.S. Airline Workers

Number of Employees and Average Salaries and Benefits Per Employee at A4A Carriers + Delta

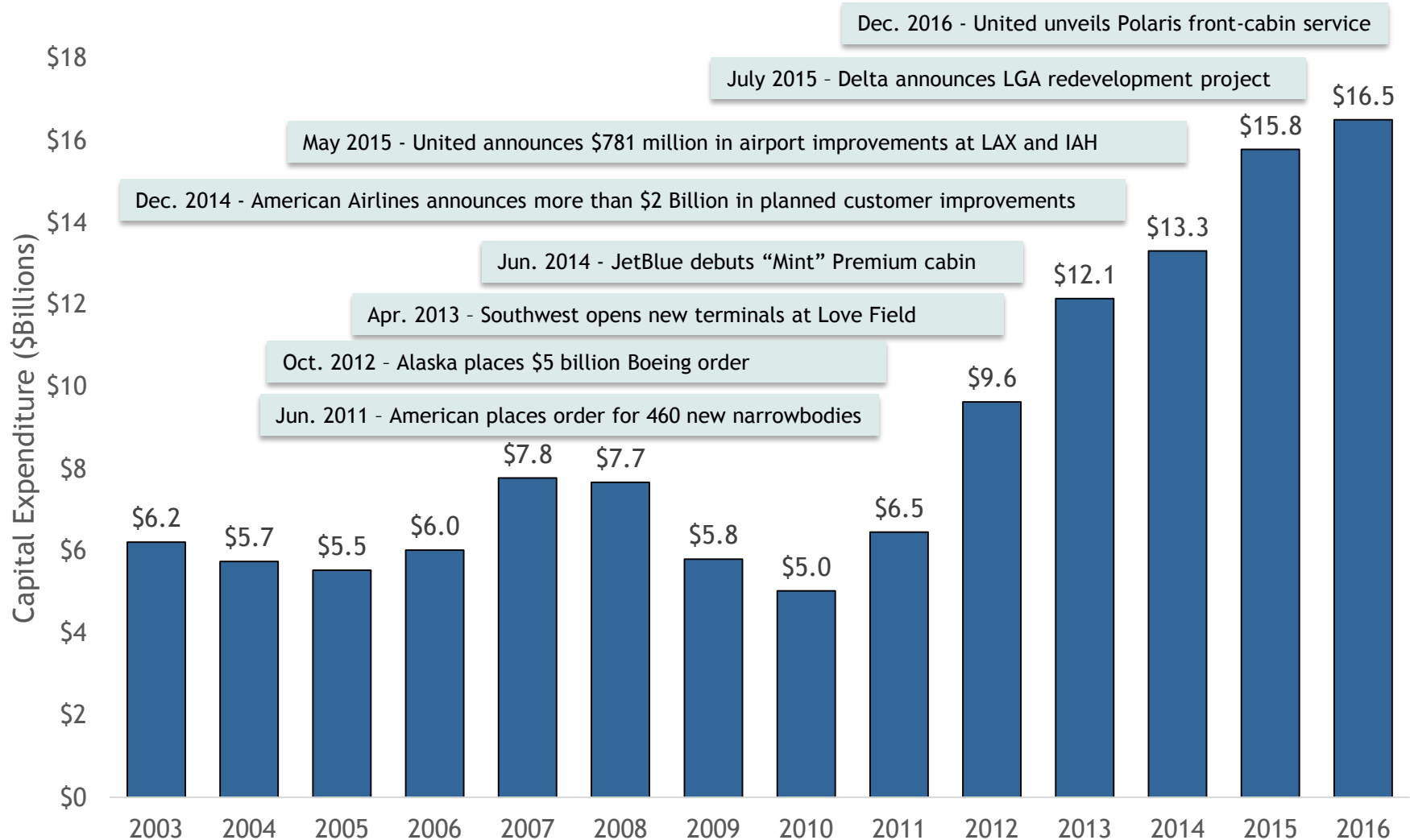


Source: U.S. DOT Form 41.

Notes: Mainline service. Average salaries and benefits in 2016 dollars. Merged carriers included for all years. A4A passenger carriers are Alaska, American, Hawaiian, JetBlue, Southwest, and United.

Profitability Has Also Allowed U.S. Carriers to Triple Capital Expenditures Over the Past Six Years

A4A Carrier and Delta Capital Expenditures

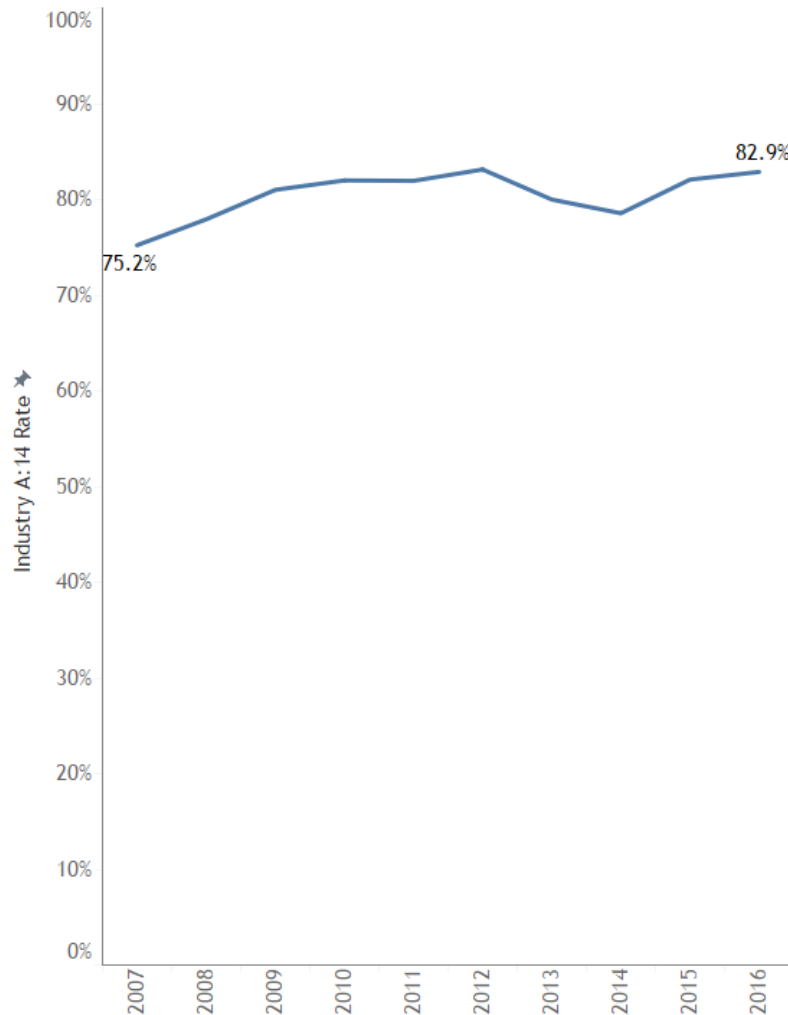


Sources: SEC filings and press releases of American, Alaska, Delta, Hawaiian, JetBlue, Southwest, and United.

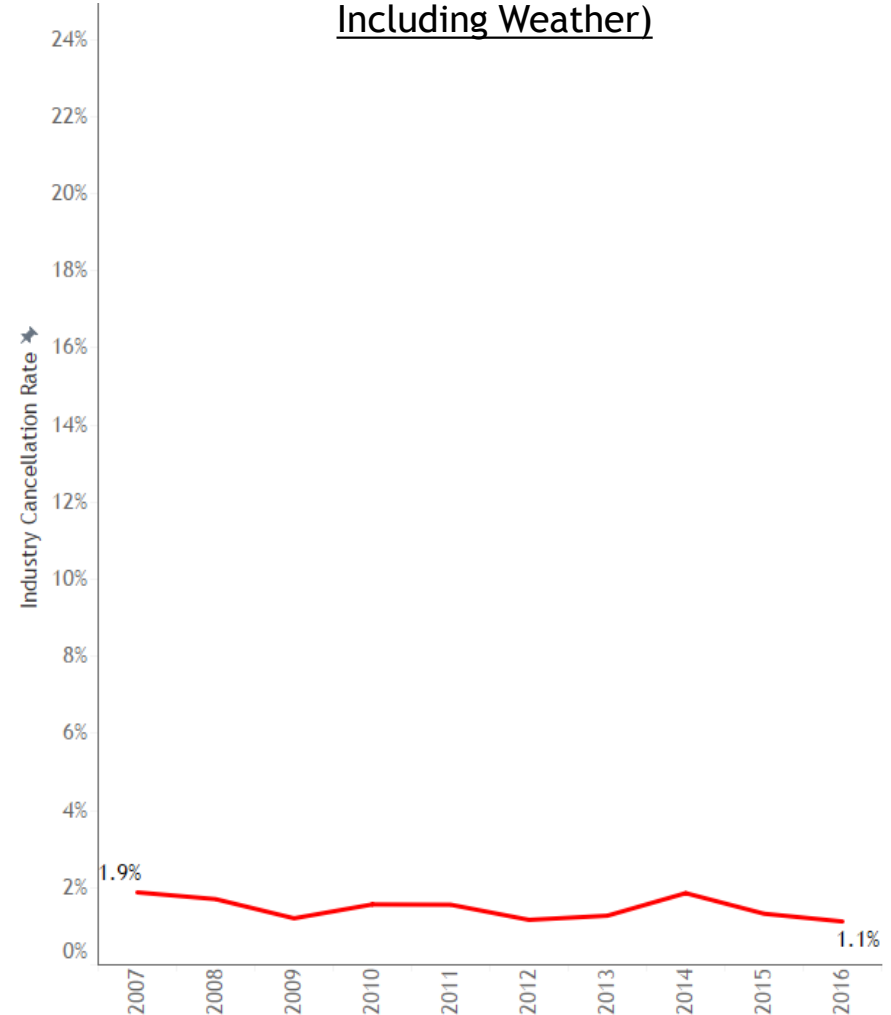
Notes: Includes merged carriers in all years.

Operational Reliability Since the Most Recent Set of Mergers Has Increased to Its Highest Level in Years

On-Time Arrival Rate (A:14)



Flight Cancellation Rate (For Any Reason, Including Weather)

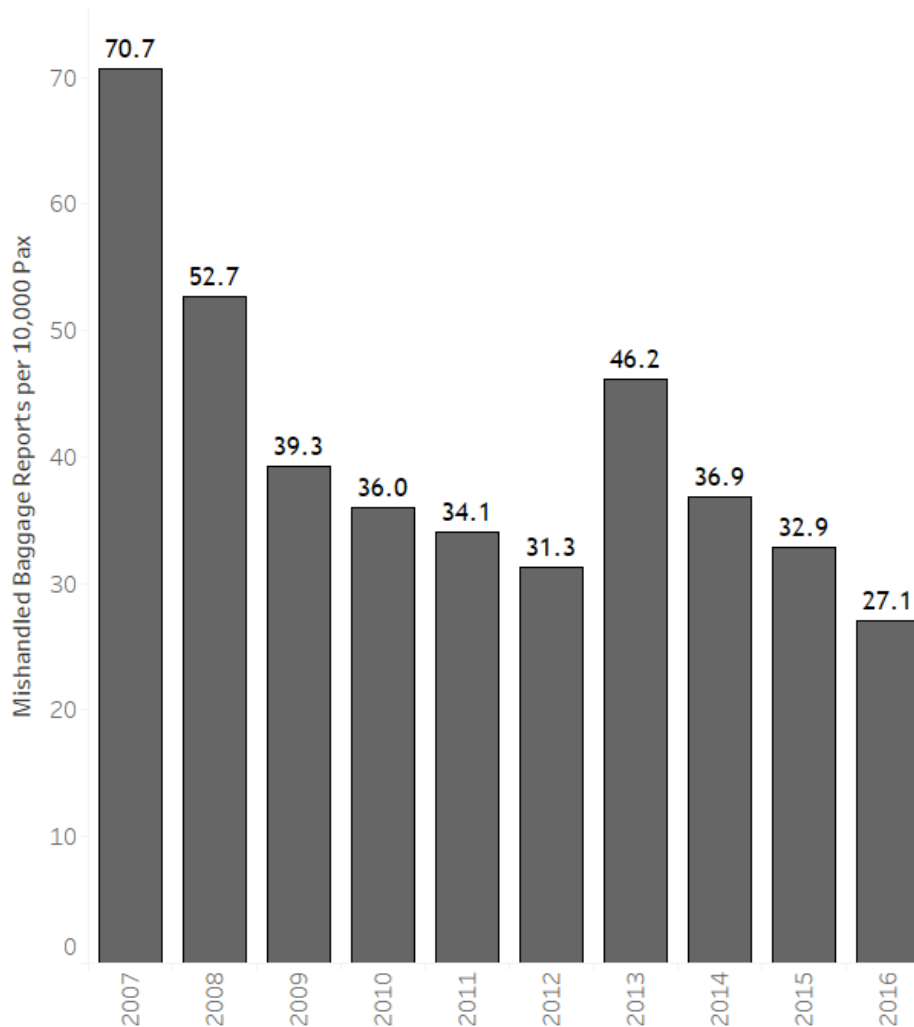


Source: U.S. DOT On Time Performance.

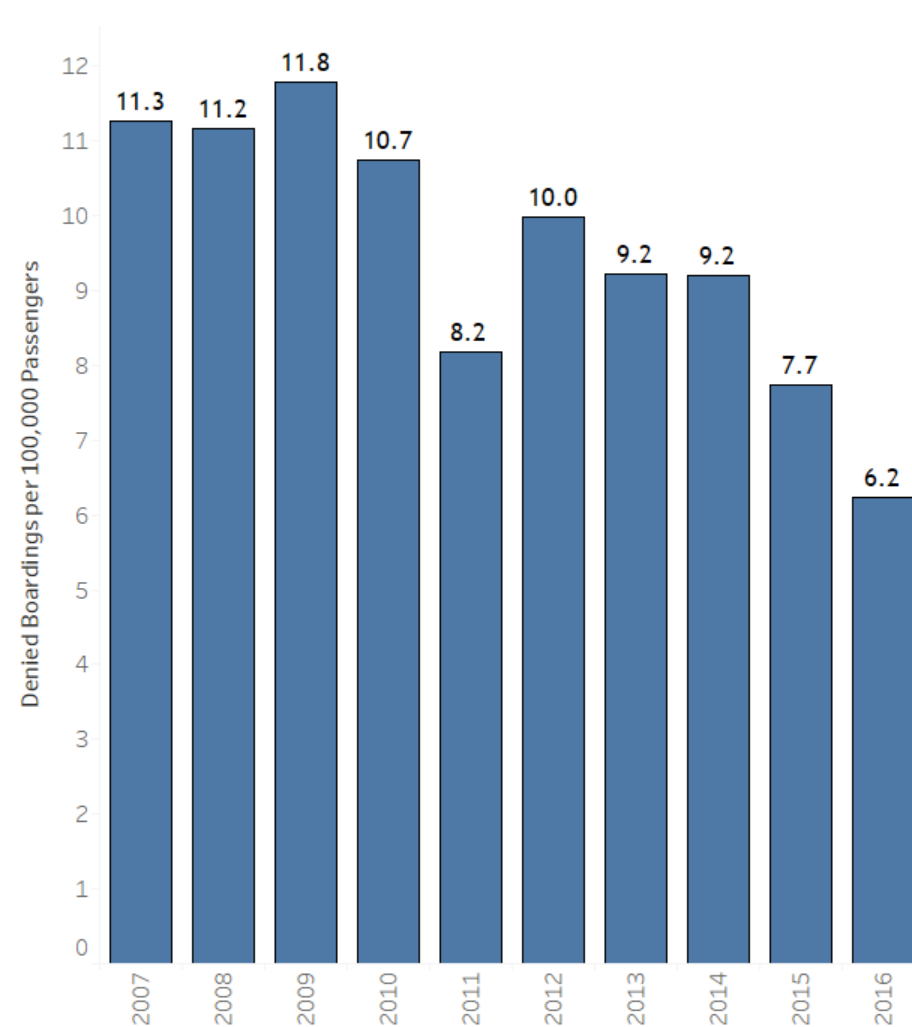
Notes: Domestic A4A and Delta rates, including regional carriers (Mesa, Express Jet, Endeavor) with 1% of annual revenue passengers. Includes merged carriers in all years. A:14 rate is percentage of completed flights arriving within 14 minutes of scheduled arrival time. Cancellation rate is percent of cancelled scheduled operations. A4A passenger carriers are Alaska, American, Hawaiian, JetBlue, Southwest, and United.

Mishandled Bags and Denied Boarding Rates Are at Their Lowest Rates in the Last Decade

Mishandled Baggage Per 10,000 Passengers



Denied Boarding Per 100,000 Passengers

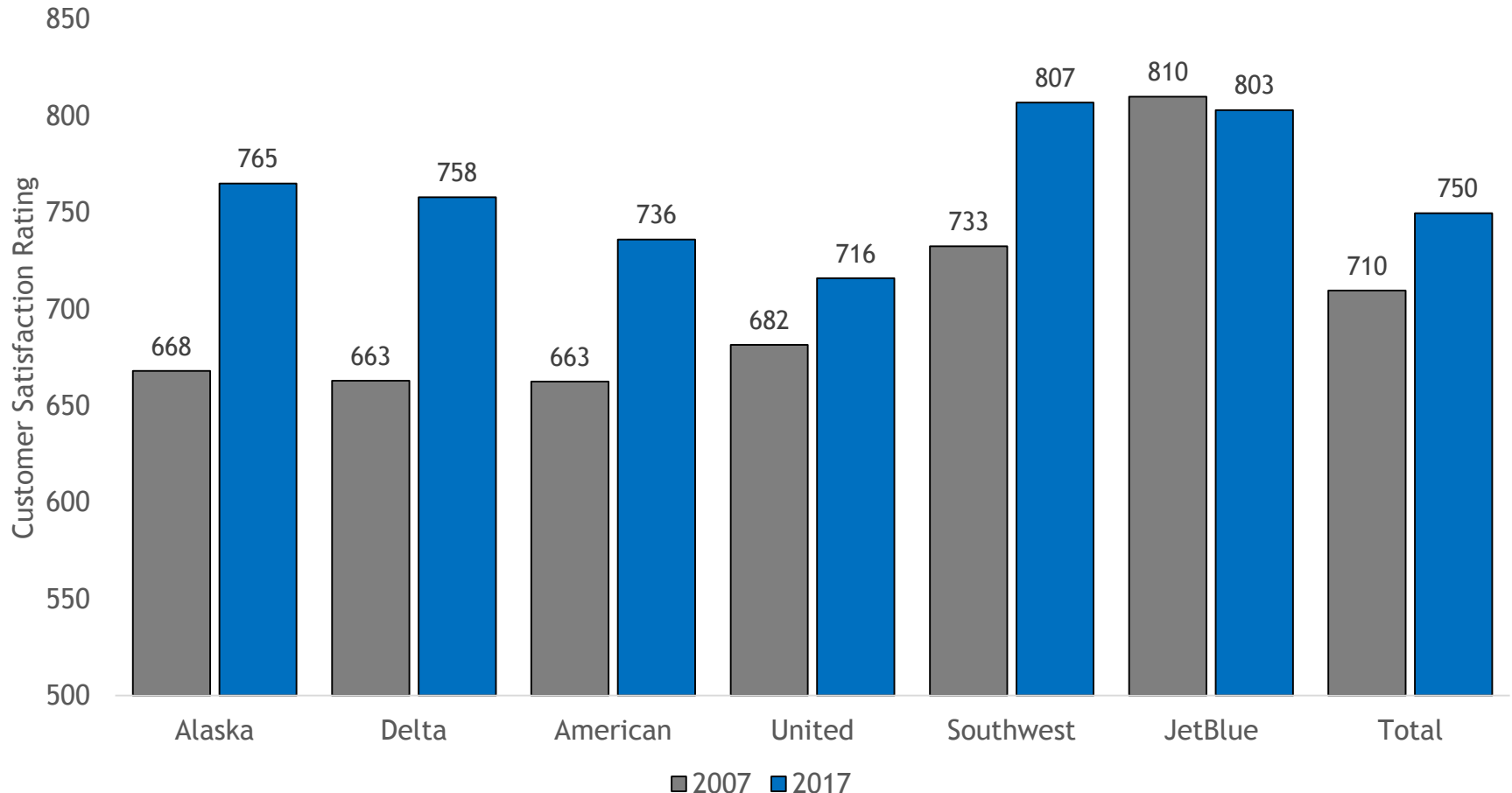


Source: U.S. DOT Air Travel Consumer Reports.

Notes: A4A carriers and Delta, including reporting regional carriers. Passengers are denied boarding if they are involuntarily bumped from their reserved seat due to oversale. A4A passenger carriers are Alaska, American, Hawaiian, JetBlue, Southwest, and United, including predecessor carriers.

JD Power's Latest Study Shows that Customer Satisfaction Has Increased to the Highest Level in a Decade

JD Power North America Airline Satisfaction Study, 2007 v. 2017



Source: JD Power North America Airline Satisfaction Study, 2007-2017.

Notes: Based on 1,000 point scale. Ratings are “based on performance in seven factors (in order of importance): cost & fees; in-flight services; aircraft; boarding/deplaning/baggage; flight crew; check-in; and reservation.” 2007 carrier ratings are based on the simple average of merged carriers (e.g., United’s plus Continental’s score in 2007 divided by two).

Embry-Riddle's 27th Annual Airline Quality Rating Indicated that Overall Airline Quality Reached Its Highest Level Ever in 2016

- According to the recent Airline Quality Rating 2017 study:
- “The 2016 score is the best AQR score in the 26 year history of the rating.”
 - “Improved performance was seen in all four of the areas tracked.”
 - “Improvement in industry performance in all of areas in the ratings is a positive sign for consumers and airlines alike.”



The U.S. Airline Industry's Renaissance Has Resulted in Robust Competition Benefitting Consumers, Airline Employees and Communities Across the Country

Flourishing Consumer Choices

- No reduction in the average number of competitors per city-pair since mergers.
- Rapid expansion by “premium-value” carriers such as Alaska and JetBlue, as well as ULCCs.
- Multitude of fare and service options (i.e., Basic Economy, Economy, Premium Economy, Business/First) on Global Network Carriers.

Highly Competitive Fares

- The “Southwest Effect” is alive and well.
- Rapid expansion by ULCCs charging fares well-below even those of Southwest and the other LCCs, and competitive responses by global network carriers hold fares down.
- Average domestic fares at or near their lowest level in history (with or without bag fees).

Higher Quality Service

- On-time rate and completion factors at highest levels in a decade.
- Mishandled bag and denied boarding rates at their lowest levels in a decade.
- Customer satisfaction rates at well above pre-merger levels.

Profitability Benefits Stakeholders

- Capital spending has tripled since 2007 as airlines renew fleets and upgrade airports.
- Resumption of job increases and wage growth for airline employees following more than a decade of furloughs and restructuring in bankruptcy.

Author Bios



Daniel M. Kasper (dkasper@compasslexecon.com)

- J.D. and MBA, University of Chicago
- Senior Consultant, Compass Lexecon
- Former Director of International Aviation at the U.S. Civil Aeronautics Board
- Formerly on the faculties of the Harvard Business School and University of Southern California School of Business Administration



Dr. Darin Lee (darin.lee@compasslexecon.com)

- Ph.D. in Economics, Brown University
- Executive Vice-President, Compass Lexecon
- Author of nearly 20 published articles on the airline industry in leading economic journals such as the *Journal of Law & Economics*, *Journal of Labor Economics*, *Economics of Transportation* and *Journal of Economic Strategy & Management*.
- Editor of volumes 1 and 2 of *Advances in Airline Economics*.