

Airline capacity discipline in the U.S. domestic market



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ABSTRACT

Using data from 1995 to 2016, this study examines airline capacity growth in the U.S. domestic market, and its impact on revenue. The results show that, after controlling for the strength of the economy and the price of fuel: (1) decreases in total domestic airline capacity are strongly correlated with increases in average domestic revenue per available seat mile (RASM); and (2) decreases in total domestic airline capacity are strongly correlated with increases in total domestic revenue. The results also show that using the real GDP growth rate as the focal point for capacity growth may help airlines maintain or slightly increase RASM over time.

The data show that the average year-over-year domestic capacity increase during 2011–2015 was lower than in the past. Also, while individual airlines continue to add capacity at different rates, the variation between airlines is less than before industry consolidation.

1. Introduction

Between 2001 and 2010, U.S. airlines had a collective net loss of over \$58 billion. Summarizing a widely-held view of the industry, famed investor Warren Buffett observed that “if a farsighted capitalist had been present at Kitty Hawk, he would have done his successors a huge favor by shooting Orville down” (Buffett, 2008). He complained about the “kamikaze pricing tactics of certain carriers,” and concluded that “[i]t's impossible to be a lot smarter than your dumbest competitor” (Buffett, 2007). From 2011 to 2016, however, the situation changed dramatically as U.S. airlines reported a collective net profit of over \$56 billion.¹ In 2016, Buffett's firm concluded that the industry appeared to have solved its long-standing overcapacity problem, and made large investments in each of the four major U.S. airlines (Derousseau, 2017).

What changed over this period and why? The most obvious change since 2000 has been the consolidation of the U.S. airline industry from seven major airlines into four much larger airlines² that collectively have about 80 percent of domestic capacity, as measured by available seat miles.³ Over a five-year period beginning in 2009, mergers took place between Delta and Northwest; United and Continental; Southwest and Airtran; and American and US Airways.

The conventional wisdom espoused by airline industry analysts

and executives is that limited capacity growth or “capacity discipline” is the key to improved airline profitability and that “capacity should not grow more than GDP” (Reed, 2015). Despite the importance of this subject, no prior published study tests the relationship between capacity discipline and U.S. airline financial performance.

Using data from 1995 to 2016, this study examines capacity growth in the U.S. domestic market, and its impact on RASM⁴ and revenue. The results show that, after controlling for the strength of the economy and the price of fuel: (1) decreases in total domestic airline capacity are strongly correlated with increases in average domestic RASM; and (2) decreases in total domestic airline capacity are strongly correlated with increases in total domestic revenue. In addition, using the GDP growth rate as the focal point for airline capacity growth may help airlines maintain or slightly increase RASM over time. Although it is not surprising that greater domestic capacity is correlated with lower airfares, the strength of the relationship between capacity changes and changes in average RASM and airfare, and total domestic revenue is surprisingly strong, especially since 2005.

The data show that the year-over-year domestic capacity increase and variance for the five-year period 2011–2015, were lower than in the past. Also, while individual airlines continue to add capacity at different rates, the variation between airlines is less than before industry consolidation.

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¹ Source: SEC reports 2016 and MIT Airline Data Project.

² In 2000: United, American, Delta, Northwest, Continental, US Airways, and Southwest, plus several much smaller airlines. In 2016: American, Delta, United, and Southwest, plus several much smaller airlines. Airline mergers since 2000 and capacity added by merger are shown in Appendix A1. See Borenstein (2011) for discussion of why airlines have been unprofitable; see Morrison (1996) for long term effects of airline mergers.

³ In an industry where the product is instantly perishable, capacity is synonymous with supply.

⁴ Capacity is measured by Available Seat Miles (ASMs); unit revenue is measured by Revenue per Available Seat Mile (RASM).

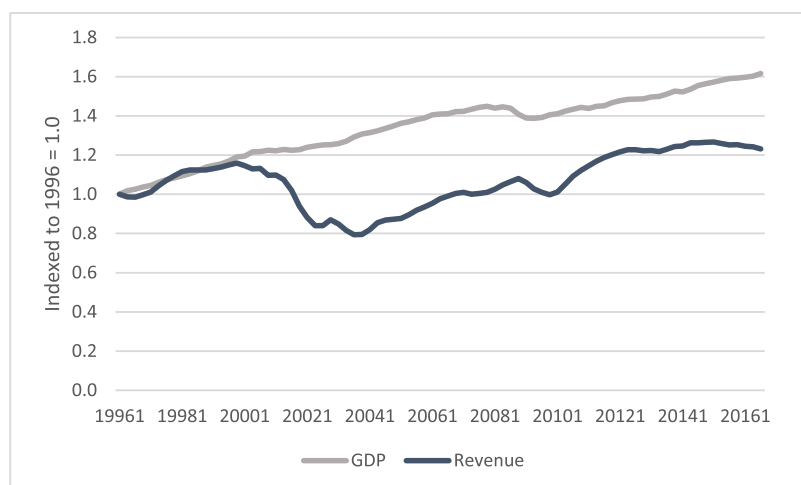


Fig. 1. Real domestic revenue and chained GDP, Indexed to 1996 = 1.0. Source: Diio compilation from US DOT Form 41, and Bureau of Economic Analysis.

Notes: 19961 denotes 1st quarter 1996. Domestic capacity and revenue are rolling last 4-quarters.

The reason for focusing on the domestic airline market, as opposed to the combined domestic and international U.S. airline market is that only U.S. airlines are permitted to provide domestic service and only four U.S. airlines provide about 80 percent of domestic capacity. Conversely, many foreign and U.S. airlines provide international air service to and from the U.S., which makes it much less likely that airlines will align their international capacity to maximize collective profitability. In addition, data on international airfares is less reliable and subject to federal nondisclosure rules.

The study raises fundamental questions for further research. Why has the consolidated industry been more successful at limiting capacity growth? Is limited capacity growth a natural consequence of consolidation and, if so, is it likely to be a permanent feature of the U.S. airline industry?⁵ What factors other than industry concentration may be important in fostering “capacity discipline”?

2. Background

The U.S. domestic air travel market is mature. As shown in Fig. 1, total domestic airline revenue grew by only 24 percent in real terms over the 20-year period from 1996 to 2016, compared with 60 percent real GDP growth. The comparison is important because of the claimed relationship between GDP growth and industry revenue growth, which will be discussed later. Industry analysts commonly assume that industry revenue will grow at about the rate of GDP growth, but this has been true only for limited periods.⁶

As shown in Fig. 2, during portions of the past 20 years, domestic airfare and passengers have moved in roughly opposite directions, as to a lesser extent have capacity (ASMs) and unit revenue (RASM). Throughout the 20-year period, improved revenue management and scheduling practices enabled the airlines to continually increase load factors,⁷ which in turn allowed them to generate higher RASM and to expand capacity by less than the increase in passengers. Fig. 2 shows the changes in airfare, passengers, RASM and ASMs, as well as the

⁵ For example, American Airlines' CEO was quoted in September 2017 as saying that the airline industry has changed so radically that his company will never lose money again: “We have an industry that's going to be profitable in good and bad times” (Koenig, 2017).

⁶ See Stalnaker et al. (2016, p.19), “The theory is that domestic airline revenue is largely a function of GDP and, therefore, unit revenue (yield) will be diluted to the extent that capacity increases at a more rapid rate than GDP”.

⁷ From 1995 to 2015, the average domestic load factor increased from 66 to 86 percent. Source: analysis of data from MIT Airline Data Project.

seasonal nature of the business.⁸

Airline analysts and industry executives have long claimed that airline profitability and pricing power are dependent on industry-wide “capacity discipline” and that healthy airline revenue growth requires that airline capacity increases be limited to approximately the same rate as GDP growth. This study examines these claims. See examples below.

Credit Suisse (Yates, 2014):

Five major mergers since 2005 have consolidated the domestic airline industry to 4 carriers that control more than 80% of capacity. This oligopolistic structure and *consistent capacity discipline* is driving sustainable pricing power.

The United States Government Accountability Office (2014, p.32):

[U]nlike prior recoveries when airline capacity growth undermined the ability to charge profitable fares, airlines since 2009 have *restrained capacity growth* even though demand for air travel has risen with the economic recovery.

Maxon (2014):

Regarding growth “in line or below’ the rate of the gross domestic product,” “we’re not sure who invented this, but many now believe it represents a threshold of what’s acceptable.”

Reed (2015):

“A frequently cited rule of thumb is that capacity should not grow more than GDP.”

Rich (2015):

“Wall Street prefers that capacity grow in line with GDP.”

CAPA (2017):

United “has been a strict adherent to keeping capacity growth in line with GDP.”

Stalnaker et al. (2017, p. 10)

“We continue to postulate that a positive revenue environment depends on capacity discipline at or below GDP growth.”

Under Cournot conditions, when firms limit supply, the price adjusts

⁸ Because of the seasonal nature of domestic capacity, a seasonal fixed effect was included in the initial regression analysis, but proved to be unnecessary as the results were virtually identical to a simple analysis of year-over-year changes on a quarterly basis.

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