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MOVING BEYOND DEREGULATION†

Why Can't US Airlines Make Money?

By Severin Borenstein*

The US domestic airline industry was effectively deregulated in the fall of 1978 with elimination of most economic restrictions on new entry and pricing. The industry lost $10 billion from 1979 to 1989, made $5 billion in the 1990s and lost $54 billion from 2000 to 2009 (all figures in 2009 dollars).[1] To put these figures in context, at the end of 2000, after six consecutive profitable years, the entire book value of US passenger carriers' assets was $159 billion and shareholder equity was $40 billion.

This dismal financial record isn't what economists, analysts, or industry participants predicted in 1978. It is a puzzle to industrial organization economists and a challenge to the views of deregulation advocates. The puzzle is compounded by the fact that the industry saw robust investment until 2001 and has seen only modest disinvestment in the financially disastrous 2000s. From 1979 to 2001, the US airline passenger fleet grew in every year, by an average of 4.9 percent per year measured by aircraft and 3.6 percent per year measured by aircraft-seats. After peaking in 2001, aircraft and aircraft-seats declined from the end of 2001 to the end of 2008, 1.7 percent and 1.4 percent per year respectively.

There is no conventional long-run equilibrium explanation for an industry that perpetually loses money, but there are a number of disequilibrium theories that have been suggested by industry participants, financial analysts, and researchers. In this short paper I discuss some of these theories and attempt to narrow down the range of plausible explanations.

I. Exogenous Cost Drivers: Taxes and Fuel

Industry leaders argue that taxes on airline tickets have risen drastically and are a significant contributor to the airlines' losses. The ticket tax today includes a 7.5 percent excise tax and fees of $6.20 per segment flown. In addition, many airports impose passenger facilities charges (PFCs) of up to $4.50 on each passenger boarding a flight at the airport. One can argue about whether these taxes are excessive given the government costs of supporting the industry, but it is difficult to see how these would lead to long-run losses. The average tax (including federal ticket taxes and PFCs) as a percentage of the base ticket price has climbed steadily and is today about twice as high as when it was 8 percent through most of the 1980s. But the average dollar tax per ticket is today about $43 ($2009), just a dollar or two more than it was in the late 1990s, the industry's most profitable years.

Over the last 30 years, the form of taxation has changed. In the 1980s, the entire ticket tax was a percentage of the ticket value. Today, about half of ticket tax revenues come from fixed per-segment fees. PFCs were added in the early 1990s, the segment tax in 1997, and the September 11 security fee in early 2002, all based on the number of flights the passenger boards, regardless of the fare paid. As a result, as real fares have declined 28 percent since 1992, dropping significantly after the September 11 attacks, the tax burden has

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* Haas School of Business, University of California, Berkeley, CA 94720-1900 (e-mail: borenste@haas.berkeley.edu). For helpful comments, I thank Silke Forbes, Will Gillespie, Ken Heyer, Paul Joskow, Nancy Rose, and Catherine Wolfram. This paper is dedicated to the memory of Alfred E. Kahn, who passed away on December 27, 2010. I was lucky enough to work for Fred at the Civil Aeronautics Board in 1978 and to speak with him occasionally since then about the airline industry and government regulation. His approach to industrial organization and regulation, and the application of research to nonpartisan policymaking, set a standard to which all IO economists should aspire. His insights continue to influence the best research on economic regulation. He was the very model of a modern (and thoughtful) IO economist.

[1] I focus on net income before extraordinary charges and gains. Including such adjustments doesn't alter the basic analysis but for some carriers causes large profit swings from one year to the next. For a more detailed description of the analysis reported here, see Severin Borenstein (2011).

increased as a percentage of the base fare. But the implied shift of demand (or marginal cost) that airlines face due to ticket taxation is today about the same as it was just before 9/11.

While taxes and fees have changed incrementally, the industry scale has changed massively. In the standard long-run adjustment dynamics, it seems that the industry should have been able to achieve the scale change necessary to incorporate and pass through these taxes. My own research (in progress) suggests that changes in passenger facilities charges are nearly entirely passed through to customers within two quarters.

Fuel cost increases have certainly been a significant component of losses in some years, most obviously 2008. Over the deregulation era, however, oil costs were highest in the first seven years and the most recent five years—over $40 per barrel in 2009 dollars—but in the 19 intervening years—1986 to 2004—real oil and jet fuel prices were relatively stable and much lower than in the early period of deregulation. Yet, the industry still lost money in 13 of those 19 years and on net lost $31 billion ($2009).

When shocks do occur, there doesn't appear to be any barrier to capacity adjustment over three to six months in response, as occurred in the second half of 2008. Still, whether in response to higher taxes or oil prices, reducing flight schedules doesn't eliminate costs if those costs are fixed or sticky. In times of growing demand, carriers can adjust fairly smoothly to unanticipated cost increases by growing more slowly, without having to ground aircraft or reduce work force size. When demand is stagnant or declining, however, rescaling operations in response to upward cost shocks is more difficult and costly.

II. Exogenous Demand Shocks

The role of demand shocks in airline losses is most notable in 2001–02 and in 2008–09. Prior to 9/11, however, it appears that domestic demand grew fairly steadily. Inferring demand shifts from average price (adjusted for trip distance) and revenue passenger-miles, demand changes are presented in Figure 1 along with the change in US real GDP for comparison.[2]

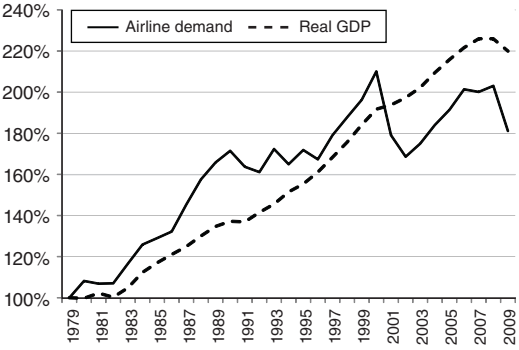

Figure 1. Airline Demand and Real GDP, Relative to 1979

Demand increased by 110 percent from 1979 to 2000, growing in 16 of those 21 years. Yet, the industry made money in only eight of those years and overall lost $3 billion (2009 dollars) over this period. The intermittent economic downturns during this period certainly affected airline industry profits, but it's very unlikely that investors expected demand growth would be completely constant and steady. It is hard to see how unanticipated demand shocks during this time could be a credible explanation for the overall poor performance before 9/11.

Demand shocks are a more plausible explanation for the losses of the 2000s. The post-9/11 demand drop, which was about 20 percent from 2000 to 2002, was unprecedented. By 2008, demand was still about 3 percent lower than it had been in 2000, and then it fell 11 percent in 2009. Because of the fixed capital costs and sticky labor costs, the decade of depressed demand was accompanied by a decade of depressed prices. In real terms, prices were 20 percent lower in 2009 than in 2000 despite the fact that jet fuel prices were about $0.59 per gallon (52 percent) higher, which, based on 2009 revenue passenger-miles per gallon of fuel, raised overall costs by about 9 percent.

III. Entry and Expansion of Low-Cost Carriers

Many industry observers and participants point to low-cost (and low-fare) carriers (LCCs)

[2] Following Borenstein and Nancy L. Rose (2007), demand is assumed to be $Q = AP^{\varepsilon}$, where Q is domestic revenue passenger-miles, P is an index of domestic yield (adjusted for trip distance) and $\varepsilon = -1$. Figure 1 tracks A over time. See Borenstein (2011) for details.

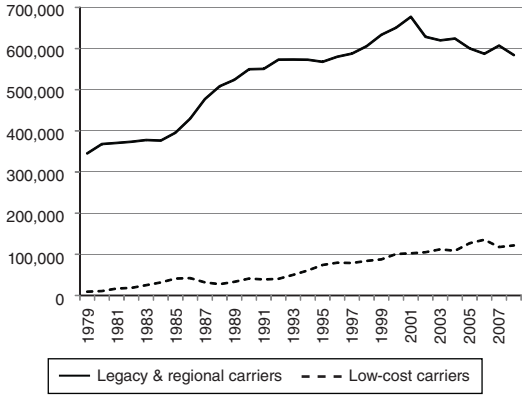

FIGURE 2. AIRCRAFT-SEATS IN FLEET

as part of the reason for low industry profits, but there is wide disagreement on what the connection is. If LCCs are simply offering a lower-quality product, then their differentiated product should find its niche in the market if there is sufficient demand for that quality level, yielding an equilibrium with both types earning normal returns.

Among industry and labor leaders, a common view is that new low-cost entrants and LCC incumbents have made excessive capacity investments during growth periods, and sometimes even during downturns, that have depressed prices for all. In order to discourage excessive investment, the largest airline pilots union has called for increasing capital requirements as part of FAA licensing of new airlines.

But the evidence doesn't appear to support the idea that new entrants or older LCCs are more prone to overinvestment than the legacy airlines. Figure 2 presents the aircraft-seat fleet size of LCCs and non-LCCs (including legacy carriers and regional carriers who generally operate as codeshare partners to the legacy carriers). It shows that LCCs in aggregate have experienced no more erratic fleet size adjustments despite being less well-established on average.[3] In fact, they continued to grow gradually even after 9/11 while remaining much less unprofitable than the legacy carriers, as shown below. If anything, it appears to be the legacy carriers who are more prone to overinvestment relative to the growth of their traffic. Figure 2 also shows that the changes in LCC fleet size are dwarfed by the variation of the non-LCC fleet, suggesting that LCC investment decisions have not been the primary driver in industry capacity changes.

An alternate view of LCCs is that they have been gradually chipping away at the entrenched positions of legacy carriers that have much higher costs. The change has been gradual, because the legacy carriers are also protected by network marketing programs and other activities that raise barriers to entry by more efficient firms. Potentially exclusionary activities of legacy carriers include frequent-flyer programs (FFPs) and corporate discount programs that exchange discounts for customer loyalty on a portfolio of unrelated routes,[4] as well as relationships with airports that allow large incumbents to restrict the availability of gates, landing slots, and other resources to potential entrants.

LCCs have been growing steadily since the early 1990s, from about 10 percent market share in 1994 to about 24 percent in 2009, with Southwest accounting for about half of LCC traffic in most years. LCCs now compete (defined as at least 10 percent passenger share) on over 60 percent of all airport pairs. And LCCs have maintained much lower costs than the legacy carriers. Figure 3 shows that, adjusted for the average flight distance, legacy carrier costs have remained 30 percent to 60 percent higher than the LCCs' for nearly all of the deregulation era, averaging about 40 percent higher in the last decade.

While the cost differential between LCCs and non-LCCs has remained large, the average price differential has been shrinking, as shown in Figure 4. Figure 4 is adjusted for the average trip distance of passengers flying on each type of carrier. LCC fares have declined much less than those of legacy carriers in the 2000s, reflecting their lower burden of excess aircraft capacity. This is no doubt a large part of the reason that LCCs have suffered much milder losses in the 2000s, as shown in Figure 5.

[3] The declines in 1987, 1988, and 2007 were due to a legacy carrier absorbing an LCC.

[4] Borenstein (1996) discusses the potential anticompetitive effects of such repeat-buyer programs in more detail. Mara Lederman (2007, 2008) presents evidence on the impact of FFPs.

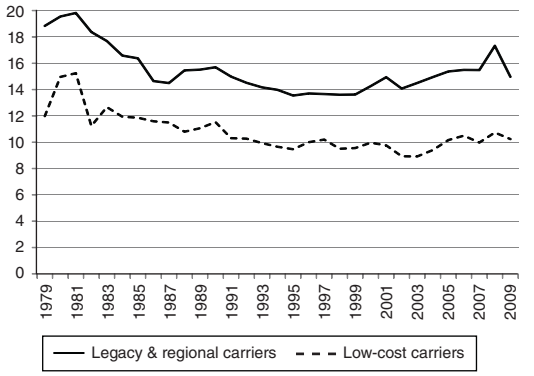

Figure 3. Operating Cost per Available Seat-Mile (*2009 cents, adjusted for flight distance*)

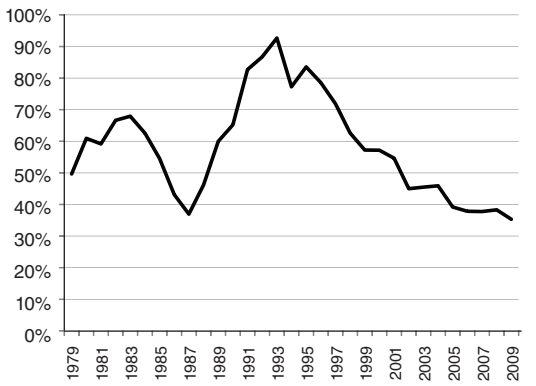

Figure 4. Price Premium of Legacy Carriers (*adjusted for trip distance*)

IV. A Series of Unfortunate Events?

Demand and cost shocks have certainly played a significant role in the airline industry's poor financial results, but there is little reason to think those disruptions will be less frequent in the future. After more than 30 years, it seems unlikely that airline losses are due entirely to a series of unfortunate exogenous events relative to what management and investors should have expected.

Throughout deregulation, the legacy carriers have maintained much higher costs than LCCs, but the price premia they have been able to charge have declined by more than 60 percent over the last 20 years.[5] As a result, while the exogenous demand and cost shocks have affected all carriers, the legacy airlines have fared much worse financially, and LCCs have grown steadily.

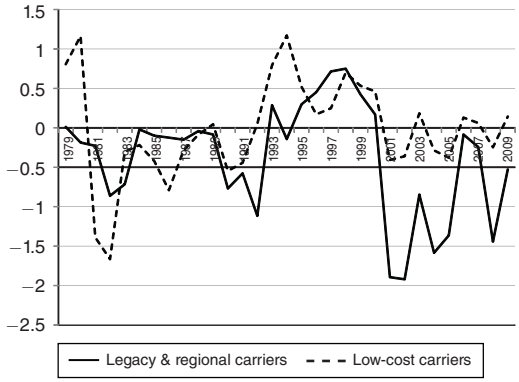

Figure 5. Net Income per Available Seat-Mile (*2009 cents*)

The response of legacy carriers has been to expand their networks through mergers and alliances. There is little evidence that such moves narrow the cost gap with LCCs, but network expansion may help differentiate their products and improve service. It also may increase their ability to use network marketing devices to dampen LCC competition.[6]

The financial results for legacy airlines and LCCs have improved substantially in 2010, and the industry seems likely to be closer to breakeven on domestic operations. Still, the experience of the last decade suggests that until legacy carriers can either close the cost gap with LCCs or increase the price premium they can maintain, they will likely have difficulty earning consistent profits through the typical cycles in the airline business environment.

This short paper obviously doesn't settle the issues surrounding airline profitability. The topic would benefit from much more investigation by industrial organization economists.

[5] All price calculations in this paper include average baggage fees and cancellation fees by airline and so account for the recent rise in revenues from these sources.

[6] There is a lengthy literature on the impact of airline alliances that expand network effects. See Olivier Armantier and Oliver Richard (2008) and citations therein.

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