



Airline competition and domestic US airfares: A comprehensive reappraisal

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ARTICLE INFO

Article history:

Received 17 December 2011

Received in revised form

4 June 2012

Accepted 6 June 2012

Keywords:

Airlines

Airfares

Competition

Merger

ABSTRACT

This paper extends recent research on the fare impacts of low-cost carriers, incorporating its adjacent-airport approach to offer a comprehensive picture of the competitive effects of both legacy carriers and low-cost carriers. The analysis measures the impact of in-market (i.e., airport-pair) competition and adjacent competition for both types of carriers, while also capturing the impact of potential competition from low-cost carriers. Moreover, this comprehensive approach is applied separately to two different types of markets, nonstop and connecting, which have not been simultaneously treated before within a single study. The results show that most forms of legacy-carrier competition have weak effects on average fares. Low-cost carrier competition, on the other hand, has dramatic fare impacts, whether it occurs on the airport-pair, at adjacent airports, or as potential competition.

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1. Introduction

The effect of airline competition on airfares has been a long-standing focus of research on the airline industry. Interest in this topic was first spurred by deregulation of US airlines in 1978, which allowed airfares to be set by market forces and removed restrictions on entry. The impacts of deregulation began to emerge in the 1980s, prompting a flurry of studies gauging the effects of competition on fares. Notable contributions include Bailey et al. (1985), Berry (1990, 1992), Borenstein (1989, 1990, 1991, 1992), Brueckner et al. (1992), Brueckner and Spiller (1994), Call and Keeler (1985), Evans and Kessides (1993, 1994), Graham et al. (1983), Hurdle et al. (1989), Morrison and Winston (1986, 1989, 1995), and others. Using a number of different approaches, these studies showed that fares indeed respond to the level of competition in airline markets, testifying to the market discipline unleashed by deregulation.

With the fare impacts of competition well established by this literature, interest in the subject waned during the 1990s. However, a major revolution was brewing in the airline industry over this period, with low-cost carriers (“LCCs”), led by Southwest Airlines, exerting a growing influence over the pricing of domestic air travel. It was obvious that LCC competition exerted dramatic downward pressure on fares, and Dresner et al. (1996) and Morrison (2001) were the first

papers to systematically measure and confirm this effect.¹ Both papers showed that the competitive impact of LCCs is substantially larger than that of “legacy” carriers, the focus of the earlier literature. Goolsbee and Syverson (2008) further studied LCC fare impacts by measuring the effect of threatened entry by Southwest, as distinct from its actual presence in a market, showing that even such a threat substantially depresses fares.²

All of these studies incorporate a key element of LCCs’ route structures: operation out of secondary airports within large metropolitan areas (examples are Midway (MDW) in Chicago and Baltimore-Washington (BWI) in the Washington, D.C. area). This pattern means that an LCC’s fare impact in an airport-pair market often arises via service at “adjacent” airports. Although the competitive effect of adjacent service was ignored in the earlier literature (e.g., Borenstein, 1989; Brueckner et al., 1992), this practice is untenable when studying the impact of competition in the LCC era.

The purpose of the present paper is to incorporate the innovations of these recent LCC studies into a broader, more-comprehensive analysis of competition and airfares in domestic US markets, focusing equally on the roles of LCCs and legacy carriers. In doing so, the paper offers the most complete domestic

¹ While Dresner et al. (1996) considered several different LCCs in their study, Morrison’s (2001) study focused exclusively on Southwest.

² The emergence of airline alliances, both international and domestic, was another important development during the 1990s, and a literature gauging the fare impacts of such alliances has emerged. See Brueckner and Whalen (2000), Ito and Lee (2007), Whalen (2007), Gayle (2008) and Armantier and Richard (2008).

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pricing study yet executed, while giving an up-to-date picture of the link between competition and fares during a time of transition and consolidation in the industry. As in much of the previous literature, the paper assumes that airport-pairs can be viewed as individual airline markets. This view contrasts with the “city-pair” approach, where multiple airports in a large metropolitan area are assumed to be a single destination (or origin), ignoring the possible distinctness of the airports in the eyes of passengers. The results of Morrison (2001) and Goolsbee and Syverson (2008), however, show that the airport-pair approach should only be used when competition from adjacent airports is taken into account. A key innovation of our paper, which follows this dictum, is the measurement of adjacent competition for both legacy carriers and LCCs within an airport-pair framework, an approach that offers a middle ground between the city-pair and traditional airport-pair setups. For example, not only is Southwest’s BWI-MDW service counted as adjacent competition for carriers serving the DCA-ORD (Washington-National/Chicago-O’Hare) airport-pair market; United’s service from Washington-Dulles (IAD) to ORD is counted as well.

In addition to its full measurement of adjacent competition, our analysis also captures the impact of potential competition. Here, the focus is solely on potential competition from LCCs, which has been shown to have a substantial effect, with legacy effects left unmeasured. Since the analysis relies on a sample that is effectively cross-sectional (covering four quarters), Goolsbee and Syverson’s (2008) intertemporal approach to capturing the effects of potential LCC competition (with both pre- and post-entry fares observed) is not possible. Instead, the measurement of potential competition follows a variant of the traditional approach, with LCC service at both endpoints of the airport-pair (or at adjacent airports) indicating a potential for entry.³

Another improvement over most previous studies is the separate consideration of two distinct types of airline markets. The first market type consists of airport-pairs enjoying nonstop service by at least one legacy carrier (referred to as “nonstop markets”). In such markets, nonstop LCC service may exist as well, and connecting service via a third airport (both legacy and LCC) is often present alongside nonstop service.⁴ Pricing within nonstop markets is described by a single regression equation, with connecting travel in these markets differentiated by a dummy variable that shifts the equation’s intercept. The estimated equation shows the fare effects of competition from nonstop service and connecting service, as well as the effects of potential competition. For both nonstop and connecting service, the regression distinguishes between “in-market” competition (which occurs on the airport pair itself) and service from adjacent airports, while also differentiating between legacy and LCC service. The second market type consists of airport-pairs lacking nonstop service either by legacy carriers or LCCs (referred to as “connecting markets”). These markets are too thin to support nonstop service, and they presumably exhibit different pricing patterns than nonstop markets. Measurement of competition is similar to that in nonstop model.

Several broad conclusions emerge from the empirical analysis. First, the impact of LCC competition is dramatic. The presence of in-market, nonstop LCC competition reduces fares by as much as 33% in the nonstop markets, and adjacent LCC competition in these markets reduces fares by as much as 20%. The strongest

effects come from Southwest, which is separated from other LCCs in the regressions. In contrast, the effect of legacy competition in nonstop markets is slight. The addition of a second legacy nonstop carrier reduces fares by at most 5.3% in these markets, with a third carrier having no fare effect. When an additional legacy carrier offers adjacent nonstop service, the fare impact in the nonstop markets is insignificantly different from zero in most specifications.

Similar findings emerge in the connecting markets. In these markets, the presence of LCC connecting service lowers fares by as much as 12%, while the effect of an additional legacy competitor is typically less than 3%. The effect of adjacent LCC competition is less important in connecting than in nonstop markets, while in-market potential LCC competition continues to have an appreciable fare impact in all specifications. The adjacent legacy carrier effect remains insignificant.

Another important finding is that the small competitive effect of legacy competition in the nonstop markets is a fairly recent phenomenon. When the analysis is repeated using data from 2000, the results show a much larger fare impact from a second nonstop legacy carrier as well as fare reductions from legacy competition at adjacent airports. The discussion offers several possible explanations for the declining effectiveness of legacy competition since 2000.

The remainder of the paper is organized as follows. Section 2 discusses the data and the construction of the variables used in the empirical model. Sections 3 and 4 present the regression results and sensitivity analyses for the nonstop model, and Section 5 considers the connecting model. Section 6 of the paper carries out a policy exercise using the estimates. The exercise is to compute the impact on aggregate fare outlays resulting from various legacy mergers, including the recent Delta–Northwest and United–Continental mergers. The results show that the increase in aggregate fare outlays tends to be small under most of the merger scenarios, reflecting the modest magnitude of the effects of legacy competition, which is reduced by a merger. Section 7 offers conclusions.

2. Data and variables

2.1. Basics

The data source is the usual one used for studies of this type, the Passenger Origin–Destination Survey of the US Department of Transportation (database DB1B), which comes from a 10% quarterly sample of all airline tickets. The sample, which spans four quarters, includes the last two quarters of 2007 and the first two of 2008, thus excluding period of the Delta–Northwest merger. Given the tumultuous state of the US and global economy in 2009, we believe that a sample ending in 2008 is preferable to a later sample. Both roundtrip and one-way passenger itineraries appear in the sample, but itineraries must have no more than three ticket coupons (and thus flight segments) in either direction.⁵ Only

³ In contrast to the usual approach, the LCC must provide service to multiple airports from each of the market endpoints (or adjacent airports) to be considered a potential competitor. See Section 2.3 for details.

⁴ The data set does not include markets where the only nonstop service is provided by LCCs. However, since such service is a principal source of adjacent competition, it is captured in the regressions.

⁵ Open-jaw itineraries (where a roundtrip passenger does not return to the origin city) are dropped. Fares greater than five times the DOT’s Standard Industry Fare Level (“SIFL”) are also excluded. Itinerary segments that are performed by regional carrier affiliates of a mainline carrier (i.e., American Eagle, Mesaba, etc.) are assigned to the (single) marketing airline, the mainline carrier. Itineraries with multiple “marketing” (or “ticketed”) carriers, which involve traditional interline travel, are dropped. However, itineraries with a single marketing carrier but multiple (non-regional) operating carriers are present in the data. These cases represent domestic codeshare itineraries, where one carrier markets a trip partly or fully flown on its (non-regional) codeshare partner’s aircraft. It is important to note that the marketing carrier in such cases is viewed as the relevant competitor in measuring the level of competition in a market. For example, if a market has

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