Economics of Transportation ∎ (∎∎∎∎) ∎∎∎–∎∎∎

Contents lists available at ScienceDirect

Economics of Transportation

journal homepage: www.elsevier.com/locate/ecotra

Government and company contracts: The effect on service and prices in international airline markets

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ARTICLE INFO

Article history:
Received 2 September 2014
Received in revised form
30 April 2015
Accepted 20 May 2015

Keywords:
International airline market
Horizontal contracts
Codesharing
Government agreements
Bilaterals
Antitrust regulation

ABSTRACT

This paper provides evidence of the impacts of the level of liberalization signed between governments and the type of codeshare agreement signed between airlines in international aviation markets. Our work distils two basic insights: (i) increasing the level of liberalization has a positive effect on service and overshadows the impact of codeshares; (ii) codeshare agreements are heterogeneous in the sense that pooling and royalty agreements generally result in higher airfares whereas block and free sale codeshares are generally associated with lower airfares, although the latter has the most significant impact. Additionally, none of the codeshare agreements impact market frequency. Our results suggest that reducing regulation in the international aviation markets is likely to increase service levels, and that carve outs on non-stop links is unnecessary, rather restrictions should be imposed on horizontal contracts such as the type of codeshare agreement signed by airlines.

1. Introduction

Codesharing agreements were originally developed by airlines in the 1980s as a means to increase visibility in the global distribution systems used by travel agents. Historically, these systems provide preferential treatment to connecting flights that involved online connections (i.e., both segments of the routes are operated by the same airline) over interlining connections (i.e., involving different operating carriers). Codesharing permitted airlines to bypass this hurdle and present such flights as if they were online flights.

The term codesharing was first coined by American Airlines and Qantas in their agreement signed in 1989. Since its inception, the codesharing concept and its application have evolved dramatically. Today, airlines code share flights in a variety of configurations: parallel/unilateral on a trunk route or behind and beyond route. Under parallel operations, both airlines operate flights in the same segment (Oum et al., 1996). Under unilateral operations, only one carrier operates a flight in the relevant segment. Interestingly, a flight under unilateral agreement may not necessarily connect to the marketing airline's network. Under behind and beyond routes, the two airlines interline their flights which enables seamless connections of two (or more) flights operated by different airlines. This form of partnership between airlines adheres to the classic notion of airline codeshares.[1]

Parallel and unilateral operations of flights are of particular interest as they give rise to virtual codesharing (Ito and Lee, 2007). Under virtual codesharing, the marketing carrier does not operate any of the segments of the itinerary. One of the foci of our research is the effect of virtual codesharing agreements in international non-stop routes. Importantly, while the literature on codeshare agreements (and airline alliances) has been growing steadily over the years, it has thus far been silent on the effect of *different* codeshare agreements. Codeshare agreements can differ substantially based on the type of collaboration and trading they entail, and can be categorized into five broad groups: hard block, soft block, free sale, pooling and royalties.[2]

The type of codesharing agreements signed between airlines is of importance to policy makers and regulators particularly in international markets—which types shall be approved and which shall be prohibited—as they may affect the competitive environment but may also benefit consumers. After the law was changed

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http://dx.doi.org/10.1016/j.ecotra.2015.05.005
2212-0122/

[1] Even in the absence of a codesharing agreement, (traditional) interlining can still be facilitated through other special and industry-wide agreements. The International Air Transport Association sets the industry standards and rules on interlining of flights not covered under codesharing agreements through the Multilateral Interline Traffic Agreement. Interlining, however, requires additional agreements between airlines to guarantee acceptance of ticketing which are generally facilitated via Special Prorate Agreements (SPAs).

[2] We elaborate and explain the different types in Section 2.

in Israel in 2009, the Israeli Antitrust Authority (IAA) was faced with this challenge exactly.[3] Accordingly, the IAA reviewed all codeshare agreements that local carriers had signed freely with a variety of foreign airlines, all of which except for one were of the virtual codeshare variety. After assessing the different codeshare contracts and their impact on competition, the IAA chose to cancel six codeshare exemptions, the airlines themselves canceled four, one airline exited the market, leaving five existing agreements to receive anti-trust immunity in addition to two new agreements that were requested during the assessment process. This series of decisions has provided us with a unique opportunity to evaluate the impact of the different virtual codeshare agreement types on frequency and transacted prices in international markets.[4] Specific details of the type of codeshare agreement between private entities are generally confidential and not available to researchers. To the best of our knowledge this is the first manuscript to analyze the effects of the type of codeshare on aviation markets.

In international airline markets there is an additional layer of regulation that may affect services offered and subsequent pricing levels. Governments sign bilateral or multilateral agreements between countries that may restrict the carriers permitted to serve the markets as well as capping frequency and demanding airfare approval or disapproval, depending on the type of agreement signed between the countries involved. There are three distinct aspects written into the bilateral agreements (Doganis, 2002): the first is the bilateral itself that outlines general aspects of the agreement, including regulation of tariffs and capacity; the second outlines the schedule of routes, which describe capacity rights and the level of freedom allocated to each of the operating airlines; and the third is an exchange of notes, often confidential, that modify certain aspects of the agreement.

The literature has generally demonstrated the negative impact of bilateral agreements between countries on airfares. Dresner and Tretheway (1992) show that liberalized bilaterals reduce economy airfares by 35% (but no significant impact was found with respect to business airfares) and recently Winston and Yan (2012) conclude that open skies agreements generate welfare gains across all fare classes. Our research further considers the degree of liberalization and its effect on frequency and transacted fares. In contrast to the existing literature, we define three levels of liberalization: highly regulated Bermuda I markets in which regulators designate one carrier per country and limit frequency, regulated Bermuda II markets in which total frequency or seat capacity is limited, and liberalized markets in which controls are removed permitting free entry of carriers belonging to the relevant countries.

Based on reduced form, supply side regressions, we find that increasing levels of liberalization have a significant positive impact on market level frequency, which reduce the impact of codeshares to insignificance. Based on fixed and mixed effects regressions, we find that pooling and royalty agreements increase fares significantly. Hard block, soft block and free sale codeshares are generally associated with lower airfares, thereby providing overwhelming support to the decision made by the IAA to eliminate pooling and royalty agreements and generally allow other agreement types. However, after focusing on markets without code share agreements and those markets that experienced the removal of codeshare agreements (without replacement), it would appear that free sale agreements bear the highest benefit to consumers followed by hard block agreements. As shown in Adler and Hanany (2015), under asymmetric and uncertain demand, codesharing on parallel links may be preferable to competitive outcomes for multiple consumer types. Hence, in hub to hub markets, it may not be necessary for governments to carve-out such links or introduce alternative restriction such as frequency freezes or price monitoring, rather it may be sufficient to impose restrictions on the type of codeshare signed. Consequently, it is not only the existence of a contract but the type of contract that impacts airfare levels, which may shed light on the conflicting results published in the literature to date.

We discuss the codesharing mechanism and elaborate on the different types in Section 2. In Section 3 we present the data to be analyzed. Sections 4 and 5 specify the estimations and discuss the results of the analysis with respect to frequencies and transacted airfares, respectively. Section 6 draws conclusions and suggestions for future research.

2. Codesharing: theory and practice

The codeshare contract may be one of five different types as discussed in the literature (Doganis, 2002), ranging from the relatively loose free-sale agreement, to the tighter hard or soft block-space style agreements, to the anti-trust immune pooling and royalty agreements. Under a free sale agreement, seats are not allocated to the marketing carrier, rather their computer reservation system directly accesses the operating carrier's system for information on booking class availability and the level of capacity available on the codeshared flight. Hence, both carriers sell seats from the same general inventory although capacity constraints on the marketing carrier's inventory might be set by the operating carrier. Since the operating carrier bears the entire financial risk in this contract, it also receives the majority of the revenues from ticket sales. The marketing carrier receives a fixed commission as a percentage of the airfare which covers marketing and other associated costs, such as frequent flyer points. Clearly the incentive to increase airfares under this contract exist, although Ito and Lee (2005) argue that the marketing carrier generally does not profit from this transaction, therefore free sale agreements are carefully balanced so that each of the carriers assume the marketing or operating role on an equivalent number of routes to ensure both sides benefit from the agreement.

Under a hard block agreement, the marketing carrier purchases a fixed number of seats from the operating carrier, which it subsequently markets independently. The blocked seats may include first, business and economy class seats. The risk for the codeshare block space is thus borne by the marketing carrier. The marketing carrier is solely responsible for ticket sales and therefore also retains all revenues or losses for the block space. Frequently, the transfer price of such blocks is zero because the arrangement is carefully balanced and includes a symmetric seat swap. Although this mechanism is less complicated to manage than a free sale agreement, for example it does not require a real-time computer connection, it has the disadvantage that it might not be efficient. For example, while one carrier might have surplus capacity, the other may have to refuse customers because all seats have been sold out (Talluri and van Ryzin, 2004). In order to reduce such potential difficulties, the contract often includes a pre-agreed cost per seat such that the marketing carrier is able to request additional seating should they be required. A soft block codeshare also allows the marketing carrier to return up to a portion of the seats on a pre-assigned date prior to the flight,

[3] Prior to the change of the law, local airlines were free to sign codesharing agreements with foreign carriers without oversight or restrictions from the Israeli regulators.

[4] We note that one of the authors was privy to the codeshare agreements as part of an advisory role to the Israeli Antitrust Authority but that a non-disclosure agreement restricts the information in this paper to whatever is available in the public domain. See also http://www.antitrust.gov.il/subject/155/item/26927.aspx for the comprehensive decisions by the Antitrust authority and the descriptions of the (virtual) code share agreements that were reviewed.

Please cite this article as: Adler, N., Mantin, B., Government and company contracts: The effect on service and prices in international airline markets. Economics of Transportation (2015), http://dx.doi.org/10.1016/j.ecotra.2015.05.005