



Assessing firm behavior in carve-out markets: Evidence on the impact of carve-out policy



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ABSTRACT

Airlines wanting to cooperatively set prices for their international air travel service must apply to the relevant authorities for antitrust immunity (ATI). While cooperation may yield benefits, it can also have anti-competitive effects in markets where partners competed prior to receiving ATI. A carve-out policy forbids ATI partners from cooperating in markets policymakers believe will be most harmed by anti-competitive effects. We examine carve-out policy applications to three ATI partner pairings, and find evidence more consistent with cooperative pricing in carve-out markets in spite of the policy, calling into question the effectiveness of the policy in achieving intended market outcomes.

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1. Introduction

Since the early 1990s, there has been an increasing trend in cooperation among international carriers in the airline industry. This is in part due to international restrictions that limit foreign carriers' service in domestic markets. Cooperation can effectively allow carriers entry into foreign markets. International carriers can establish a type of cooperation referred to as a codeshare agreement. A codeshare agreement allows a carrier to operate a flight under the guise of a partner carrier. Carriers in a codeshare agreement can sell tickets for flights on an itinerary in which a partner carrier operates at least one coupon segment on the itinerary. The result is a passenger may fly with at least one carrier on the trip itinerary that is different from the carrier that sold the ticket for the entire trip to the passenger. Additionally, international alliances allow for the carriers in the alliance to coordinate flight schedules (to decrease layover times), streamline luggage checking, share frequent flier programs and decrease gate proximity at airports, all of which improve travel conveniences for passengers. There are three major international alliances: Skyteam, Star and Oneworld. Carriers in each of these alliances may have codeshare agreements with other carriers within that alliance.

International carriers within an alliance may also apply to the antitrust enforcement authority of a country for antitrust immunity (ATI), which if granted would exempt certain cooperative actions between the carriers from being the basis of prosecution under the country's antitrust laws. Codesharing and ATI differ in the extent of cooperation allowed. Specifically, in addition to all of the cooperation associated with codesharing, if a carrier has ATI with another carrier then the ATI

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partners can cooperate with respect to setting fares. In the U.S., it is the Department of Transportation (DOT) that is tasked with reviewing applications from airlines for ATI. The DOT can deny the carriers ATI, grant the carriers ATI or grant the carriers ATI along with a carve-out. A carve-out is a legal restriction that forbids collusive behavior between ATI partners in certain markets.¹

There has been an extensive amount of research regarding the market effects of varying forms of cooperation between carriers in international air travel markets; however, research regarding carve-outs is limited. There has been no previous empirical research regarding the market effects of policymakers imposing carve-outs, which is the primary contribution of this study.

A discussion of carve-outs requires a discussion of ATI. There have been numerous theoretical and empirical studies examining the implications of ATI. The results of these studies suggest the consequences of ATI vary by interline markets versus interhub markets. Interline markets are markets in which a passenger must switch operating carriers at some point on their journey. Interhub markets are markets between the carriers' hubs in which a passenger is not required to transfer across operating carriers to complete their journey. The key distinction between these two types of markets is that the partner carriers' transportation services are complementary in interline markets, but substitutable in the interhub markets.

Brueckner's (2001) theoretical analysis suggests that ATI will lead to lower prices in interline markets, a prediction that is also consistent with theoretical analysis in Choi (2008). This is the result of elimination of double marginalization in the interline markets. However, in interhub markets cooperation will have an anticompetitive effect (raise fares). Brueckner (2001) notes the cooperation by the carriers may induce some cost efficiencies in all markets (interline as well as interhub) due to the impact of economies of passenger-traffic density. Economies of passenger-traffic density is the phrase given to the situation in which an airline is able to lower the marginal cost of transporting a given passenger on a route the larger the volume of passengers it transports through the route [see Brueckner and Spiller (1994) and Gresik and Mansley (2001)]. These cost efficiencies have a countervailing effect to the anticompetitive effect in interhub markets. Thus, if cost efficiencies in interhub markets are sufficiently large, prices may fall in these markets. Numerous empirical studies including Brueckner and Whalen (2000), Brueckner et al. (2011) and Whalen (2007) conclude codesharing and ATI each serve to lower fares in interline markets; although, ATI has the greater effect on prices. This supports the hypothesis that ATI eliminates double marginalization.²

Although there are numerous studies examining the effects of ATI, the literature regarding carve-outs is limited. Brueckner and Proost (2010) use a formal theoretical model to better understand when a carve-out can be beneficial or harmful to consumers. The theory suggests that ATI has an anticompetitive effect in interhub markets serving to put an upward pressure on prices for passengers. However, in the presence of economies of passenger-traffic density, ATI may bring cost efficiencies to the carriers. These cost efficiencies can be passed on to passengers in the form of lower prices. Depending on which effect is greater, prices may rise or fall in the interhub markets. Should potential economies of passenger-traffic density be pronounced, imposing a carve-out in principle limits cooperation, which in turn limits the ability to exploit economies of passenger-traffic densities potentially resulting in higher prices versus the alternative of no carve-out.

Brueckner and Picard (2013) explore the question of whether cooperation in interline markets increases the incentive to collude in interhub markets if a carve-out is present. Although the carriers are forbidden from jointly setting prices in the interhub markets, there may be an incentive for tacit collusion. For instance, one of the carriers raises the prices for their flights in the market and, likewise, the other carrier raises their prices without any prior discussion between the carriers. Should this occur, this would pose a problem for regulators since the carve-out may not influence the outcome resulting from cooperative behavior of the ATI partners. However, Brueckner and Picard's (2013) theoretical analysis finds that there exists no incentive for tacit collusion.

The main purpose of this paper is to empirically investigate whether market outcomes are consistent with cooperative price-setting behavior among ATI partners in their carve-out markets. In other words, do ATI partner carriers refrain from cooperatively setting prices in their carve-out markets as required by policymakers, or is there evidence of collusion in the carve-out markets? Answering this question is tantamount to assessing the extent to which application of carve-out policy elicits the market behavior of carriers that policymakers intend. The following is a brief description of the research methodology we use to investigate these issues.

We begin by specifying and estimating a discrete choice demand model of international air travel. We then assume that multiproduct carriers set travel product prices according to a Nash equilibrium. Conditional on the demand parameter estimates, the Nash equilibrium assumption allows us to compute markups and recover marginal costs of the products offered by the carriers. The structural model affords us the opportunity to compute markups and recover marginal costs under two alternative scenarios: (1) where we assume the carriers that are given ATI cooperatively set their product prices in markets designated as carve-outs; and (2) where we assume the ATI partner carriers non-cooperatively set their product prices in their carve-out markets, as required by a carve-out policy. Based on Vuong (1989), we then employ a Vuong-type

¹ In the European Union, the European Commission (EC) is tasked with granting carriers ATI. Note that the DOT only has jurisdiction over international itineraries originating in the United States. For a more thorough discussion of the process and rulings regarding ATI and carve-outs, see Bilotkach and Huschelrath (2011, 2012).

² Numerous additional studies relating cooperation in international markets to prices include, but are not limited to: Bilotkach (2005), Brueckner (2003a,b), Flores-Fillol and Moner-Colonques (2007), Gayle and Xie (2014), Hassin and Shy (2004) and Park and Zhang (2000).

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