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## **US Open Skies Agreements and Unlevel Playing Fields**

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## **Abstract**

We examine the relationship between ‘Open Skies’ agreements (OSAs) signed between the USA and various countries or regions on these markets and the absence of a so called ‘level playing field’; i.e. the existence of subsidies and other forms of protection that advantage one nation’s airlines over those of co-signatories to an OSA. We argue that under an oligopoly market structure, strategic competition brought about by OSAs creates incentives to subsidize and/or protect domestic airlines. Such incentives are maintained or amplified by political lobbying efforts that bias civil aviation policies towards producer interests over wider measures of economic welfare. We report on financial aid and policies which have co-evolved along with OSAs and which have advantaged US airlines during the OSA period and which suggest that unlevel playing fields have been perpetuated and possibly made more unlevel during the era of OSAs.

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**Keywords:** ‘Open Skies’ agreements; Strategic competition; Subsidies; Protection; Level playing field.

**JEL Codes:** L93, L98

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## 1 Introduction

Since the early nineties we have been witness to an unceasing evolution towards liberalization in civil air transportation, in particular through the negotiation of ‘open skies agreements’ (OSAs), which have allowed airlines of different nations reciprocal access to each other’s markets. To the extent that such agreements represent a move to freer trade in air transport services, one might expect this trend to have resulted in a ‘leveling of the playing field’ through the elimination of subsidies and other mechanisms which advantage the airlines of one nation over those of other signatories to an OSA. However, recent disputes over unfair subsidies between the ‘big three’ US airlines (American, Delta, and United) and Gulf carriers have placed this issue in the spotlight and suggest that strategic protection may coexist with OSAs or may even be encouraged by such agreements. In this paper we consider the relationship between OSAs and practices which confer asymmetric advantages to at least one airline of a signatory nation to an OSA.

The focus of our investigation is the USA which has signed no less than 120 ‘open skies’ agreements since 1992 with countries around the world.<sup>3</sup> These OSAs replaced previously existing bilateral air service agreements which restricted the airlines that would be subject to reciprocal granting of market access rights and the extent of the market access rights being granted. In the latter case, pre-existing bilaterals were mostly limited to third and fourth freedom rights, while OSAs typically include fifth and sixth freedom rights.<sup>4</sup> Table 1 shows the chronology of US-initiated OSAs from 1992-2015. Notable in the chronology is the OSA signed by the U.S. and the EU in 2007 which applies to all 27 EU states plus Norway and Iceland who joined the agreement in 2011.

The predominant characteristic of the United States’ OSAs is expanded and less restrictive reciprocal access to markets. Increased market access for US airlines (*ceteris paribus*) also generates the prospect of increased competition both in foreign and domestic markets. From a trade policy perspective, this is desirable because competition raises economic welfare with consumers as primary beneficiaries. Whether US airlines benefit from an OSA will depend on how well they can compete in these markets, but the results of such competition are also sensitive to any mechanism which can advantage one country’s airlines over another’s. That is, just as airlines are drawn into strategic competition through an OSA, potentially so are government agencies that have the ability to provide advantages to their domestic carriers.<sup>5</sup> Failure by a government to provide its domestic carriers with a competitive advantage can be costly if foreign carriers receive such benefits from their own governments.

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<sup>3</sup> Overall, in terms of its relative market size and bargaining power the US has benefitted in most of the OSA agreements that it has made, however this fact does not speak to the distribution of benefits across US consumers and industry participants.

<sup>4</sup> ‘Fifth freedom’ refers to the right granted by Country A to Country B to fly from B to a third country (C) via A and to carry passengers from A to C - or to bring passengers from C to A en route to B. ‘Sixth freedom’ refers to the right granted by Country A to Country B to fly from C to A via a non-technical stop in B and to bring passengers from C to A or carry passengers from A to C (via B). For a complete explanation of all the ‘freedoms of the air’, see <http://www.icao.int/Pages/freedomsAir.aspx>.

<sup>5</sup> In this paper, we use the term ‘domestic carrier’ or ‘domestic airline’ to denote an airline that maintains its corporate base in its home country, is subject to the financial and tax laws of the home country and for which the bulk of employment and operations occur in the home country. For example, we refer to Delta Airlines as a domestic airline of the USA because the airline is based in Atlanta and is governed by US securities laws. Delta employs over 80,000 workers worldwide however; the vast majority of these employees reside in the US, with the majority employed in the state of Georgia.

**Table 1: Chronological list of USA open skies agreements**

Year	Countries signing open skies agreement with the USA
1992	Netherlands.
1995	Belgium; Finland; Denmark; Norway; Sweden; Luxembourg; Austria; Iceland; Switzerland; Czech Republic.
1996	Germany; Jordan.
1997	Singapore; Taiwan; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama; New Zealand; Brunei; Malaysia; Aruba; Chile.
1998	Uzbekistan; Korea, Peru; Netherland Antilles; Romania; Italy.
1999	United Arab Emirates; Pakistan; Bahrain; Tanzania; Portugal.
2000	Slovak Republic; Namibia; Burkina Faso; Turkey; Gambia; Nigeria; Morocco; Ghana; Rwanda; Malta; Benin; Senegal.
2001	Poland; Oman; Qatar; France; Sri Lanka.
2002	Uganda; Cape Verde; Samoa; Jamaica.
2003	Tonga; Albania.
2004	Madagascar; Gabon; Indonesia; Uruguay.
2005	India; Paraguay; Maldives; Ethiopia; Thailand; Mali; Bosnia/Herzegovina.
2006	Cameroon; Cook Islands; Chad; Kuwait.
2007	Liberia; Canada; Bulgaria; Cyprus; Estonia; Greece; Hungary; Ireland; Latvia; Lithuania; Slovenia; Spain; United Kingdom; Georgia.
2008	Australia; Croatia; Kenya; Laos; Armenia.
2009	---
2010	Zambia; Israel; Trinidad & Tobago; Barbados; Japan; Colombia; Brazil.
2011	Kingdom of Saudi Arabia; St. Kitts; Montenegro, Norway, Iceland.
2012	Suriname; Sierra Leone; Macedonia; Seychelles; Yemen.
2013	Guyana; Bangladesh; Botswana.
2014	Equatorial Guinea; Burundi.
2015	Togo; Serbia; Ukraine; Cote d'Ivoire.

Source: US Department of State

Of course, most trade liberalisation agreements come with conditions regarding the prohibition of unfair subsidies or favouritism by any party along with a dispute settlement mechanism to identify and rectify any breach of the agreement. However, there are two important aspects of OSAs as distinct from other trade agreements; firstly, OSAs are not administered under the umbrella of the World Trade Organization and therefore do not operate under the WTO's dispute settlement process, nor do OSAs abide by the provisions of the general agreement on trade in services (GATS). Not having a ready-made and structured complaint and dispute process makes disputes costlier to initiate and administer. Secondly, while OSAs do contain some provisions on fair competition there are no explicit guidelines regarding what sort of subsidies, financial aid or other mechanisms and policies constitute a breach of the agreement.<sup>6</sup> Article 11 of the USA's standard OSA provides a very general statement on 'fair competition';

"Each Party shall allow fair and equal opportunity for the airlines of both Parties to compete in providing the international air transportation governed by this Agreement"<sup>7</sup>

In short, the OSAs pursued by the US over the last 25 years contain a great deal of flexibility with regard to what sorts of policies or actions can be allowed that might advantage the airlines of one signatory over those of another. This has led to 'level playing field' issues being raised; specifically accusations of subsidies and unfair competition have been leveled at various nations

<sup>6</sup> See <http://www.state.gov/e/eb/rls/othr/ata/114866.htm> for the text of a standard OSA.

<sup>7</sup> Ibid. p11, Article 11, Section 1.

with some regularity during the OSA era, with a significant number of emanating from the USA. Most recently, in 2015 an organization called the ‘Partnership for Open and Fair Skies’, representing the three major US air carriers (Delta Airlines, United Airlines and American Airlines) published a white paper which accused the three Persian Gulf carriers (Emirates, Etihad and Qatar Airways) of unfair competition due to excessive state aid.<sup>8</sup> At the time of writing, these US carriers and their alliance partners continue to call for renegotiations of the US-United Arab Emirates and the US-Qatar OSAs. For their part, the Gulf carriers have launched their own counter-accusations of subsidies and anticompetitive practices in the US.

Another recent example of ‘unlevel playing field’ complaints has been the accusation of unfair competition due to ‘flag of convenience’ behaviour (Mendelsohn, 2014) by EU-based carrier Norwegian Air International (NAI) which was accused by a number of US airline labour groups and the same ‘big three’ US airlines (CAPA, 2015c, 2015d). It took Us DoT three years to issue NAI’s foreign carrier permit. (CAPA, 2016)

If the objective of U.S. open skies agreements is the equality of opportunity (market access) as articulated in the preamble of the Chicago Convention, then many of the arguments used in these ‘playing field’ disputes are irrelevant according to De Wit (2014) and CAPA (2016). Equality of opportunity does not guarantee equality of outcome, as Gillen, Harris and Oum (2002) demonstrate in measuring the liberalization effects of the Japan-Canada air transport market. Tretheway and Andruilaitis (2015) as well as De Wit (2013) underline that a perfectly level playing field did not exist prior to the era of OSAs and in fact has never existed in international air transport markets due to Ricardian rents of geographical advantages (for example, hub location in relation to international air traffic flows) and Schumpeterian rents (for example, a substantial A380 fleet). The legitimate existence of economic rents and the widely differing circumstances of nations and their aviation sectors (including such fundamental issues as state ownership, policies on airport development, taxation, labour regulation, bankruptcy and health insurance) explains why a commonly accepted definition of what a level playing field in aviation means is absent (International Civil Aviation Organization, 2013). With no commonly adhered to definition of what ‘level playing field’ means, we are thus left to consider whether the era of OSAs has led to a more level playing field than existed previously. In this paper, we will argue that while OSA’s provide reciprocal market access which stimulates air travel and market growth, they also lead to strategic competition which provides each nation signatory with an incentive to create or maintain policies or programs which advantage their own domestic airlines. Such incentives are amplified when national policy decisions regarding civil aviation are subject to a producer surplus bias wherein the interests and profits airlines receive more weight than consumer surplus in the assessment of total welfare.

We proceed in section 2 by reviewing the literature on the liberalization of air transport and on strategic trade policy. In section 3, we outline a theoretical model in which expanded access to markets via an OSA can lead to increased state level subsidies that advantage domestic airlines faced with foreign competition. We then report on the existence of state level subsidies in the US. In section 4, we broaden the analysis to consider the role of special interest group influence and the possibility of a bias towards producer surplus in civil aviation policies and programs and in support of this view we present a brief review of the literature on trade protection and policy formulation. In section 5 we report on three examples of programs and policies in the US which have advantaged US carriers during the ‘open skies’ era; debt

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<sup>8</sup> See Partnership for Open and Fair Skies (2015) .

restructuring, the CRAF/Fly America program and antitrust immunity. We offer a brief conclusion in section 6.

## **2 Liberalization, strategic trade policy and the ‘level playing field’.**

The economic effects of liberalization on the air transport industry and more specifically the effects of OSAs have been extensively analyzed in academia, government and industry. For example Fu, Oum and Zhang (2010), Button (2009), Gillen, Harris & Oum (2002) Booz Allen Hamilton (2007) share the conclusion that these liberalization efforts have brought significant welfare gains and economic growth worldwide. Fu et al. (2010) summarize the welfare gains as follows; passenger volumes have been stimulated substantially, firstly by the removal of constraints on pricing, route entry, service capacity. This has resulted in more effective competition and more efficient operations which reduced prices and increased service quality. (see also GAO, 2006). Secondly, antitrust immunity parallel to OSAs has enabled airline cooperation in alliances to optimize their network structures in global hub & spoke networks. Air services in these networks can be expanded to new and smaller destinations, as Maillebiau et al. (1995) illustrate.

Liberalization has improved the airlines’ operational efficiency and load factors through the optimization of their network and pricing strategies, resulting in steadily decreasing average costs. For example, costs can go down due to economies of density in H&S networks. Airline cooperation, either in codesharing agreements or in anti-trust immunized alliances, eliminate double marginalization through fully coordinated pricing, fares and yield management as Bilotkach and Hueschelrath (2012) discuss.

These generic observations are not always applicable to every link and node in liberalized airline networks. Monopoly power at high-density interhub routes in alliance networks may strongly increase as Brueckner and Pels (2005) demonstrate. Also, the hub dominance by a home based hub carrier allows it to achieve cost mark-ups (so-called ‘hub premiums’) in the local market as for example Leijssen, Rietveld and Nijkamp (2004) empirically confirm.

Increased liberalization and trade in industries where the market structure is imperfect competition or oligopoly can also lead to strategic behaviour and subsidies. Theoretical models of trade and industrial policy such as Spencer and Brander (1983) and Neary (1994) show how strategic competition in international trade can lead to a prisoner’s dilemma type game between competing nations that results in subsidies. Spencer and Brander (1983) develop a model of industrial strategy policies in which governments act as first-movers in a two-stage game and can influence the outcome of imperfect competition between domestic and foreign firms through the use of export subsidies. The direct effect of a subsidy to a domestic firm is to lower its costs of production; however the strategic effect of the subsidy is to shift out the reaction function of the domestic firm in Cournot competition. Knowing this, each government foresees that they will be disadvantaged if they do not subsidize but the foreign government does. The resulting Cournot-Nash equilibrium is one in which both governments (domestic and foreign) engage in positive export subsidies.

While the effects of liberalization on market growth, cost efficiency, consolidation and new business models have been analyzed in the literature, to date there has been limited academic attention paid to ‘level playing field’ issues in the context of OSAs (with the exception of Tretheway and Andruilaitis, 2015). Given an already unlevel playing field, we wish to better understand whether incentives to tilt the playing field go hand in hand with OSAs or whether incentives to subsidize or advantage domestic airlines over foreign competition that pre-date OSAs nevertheless survive to coexist in the new environment created by OSAs.

### 3 Open Skies and Subsidies

To explore how an OSA could encourage subsidization of airlines, we outline a theoretical framework developed by Morrison (2016) utilizing a simple symmetric Cournot (oligopoly) market structure in a two-country (or region), two-airline setting.<sup>9</sup> The model structure is in the spirit of Spencer and Brander (1983) with an added feature; each airline is based within a local jurisdiction in its home country and has a significant economic impact in that jurisdiction which is positively related to the airline's total output.<sup>10</sup> This impact gives rise to an incentive for the local state government to subsidize the domestic airline following an OSA.

In our symmetric model, let Country 1 (2) be the home country of Airline 1 (2) and suppose that the operations of Airline 1(2) are based exclusively in one of several local jurisdictions in Country 1(2). Without loss of generality, we can normalize foreign market access to be zero for each airline in the absence of an OSA and then compare the effects of an OSA which grants each airline access to the other's market.

Let the demand for air travel within country  $i$  be described by a linear inverse demand function of the form  $P_i = a_i - Q_i$ ; where  $Q_i = x_i + y_i; i = 1, 2$ . Airline 1 produces a total output of  $X = x_1 + x_2$  where  $x_1$  represents output sold domestically (in Country 1) and  $x_2$  represents output sold in Country 2. Similarly, Airline 2 has total output  $Y = y_1 + y_2$ . In the absence of an OSA,  $y_1 = x_2 = 0$ . We also assume that each airline has constant marginal costs of \$1 per unit of output and that  $a_1 = a_2$  (the markets in each country are of equal size).

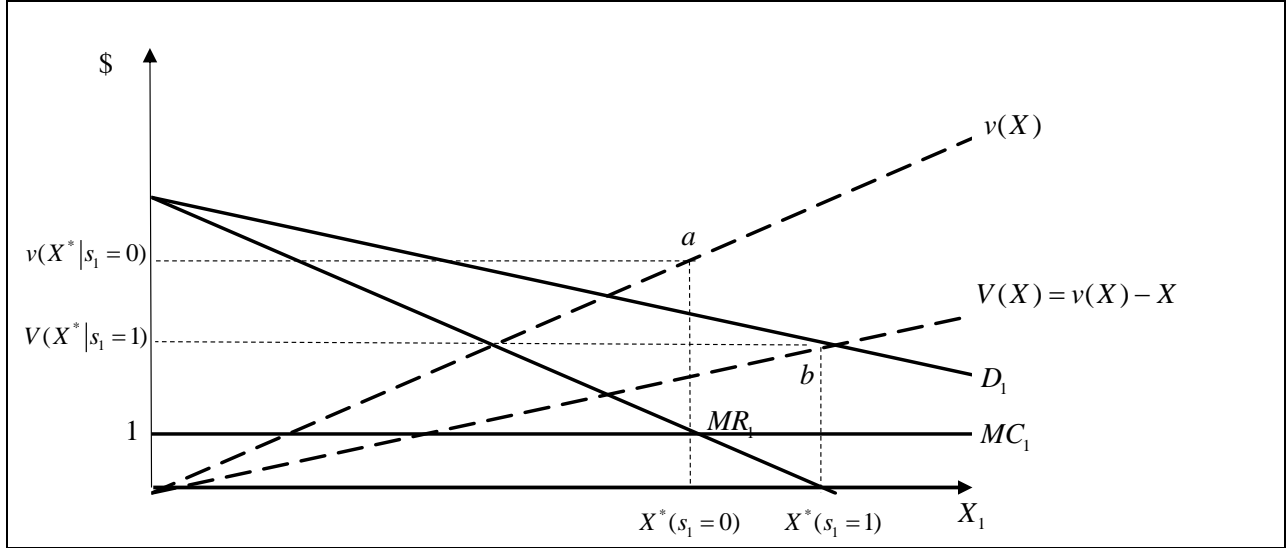
#### 3.1 No Open Skies Agreement

Figure 1 illustrates the situation in Country 1 in the absence of an open skies agreement. Without access to the foreign market, Airline 1 operates only in its home market and is protected from foreign competition. Accordingly, we can assess the airline's profit maximizing output, conditional upon whether the local jurisdiction (where it bases its operations) provides a subsidy or not. In Figure 1 we compare no subsidy ( $s_1 = 0$ ) with a subsidy of \$1 per unit of output ( $s_1 = 1$ ). In the diagram  $v(X)$  represents the economic benefit that Airline 1 generates in its local jurisdiction whereas value function  $V(X) = v(X) - X$  represents the net economic benefit to the jurisdiction if a subsidy is provided. If there is no subsidy the airline maximizes profit by equating marginal revenue and marginal cost, producing output  $X^*(s_1 = 0)$  which yields a net benefit to the local jurisdiction (indicated by point  $a$ ) equal to  $v(X^* | s_1 = 0)$ .

<sup>9</sup> Modelling airline competition within an oligopoly market structure is consistent with existing economic research. For example, in a study of 27 OECD countries and 102 air routes connecting 14 major international airports, Gonce and Nicoletti (2000) find that in the majority of routes, market power is concentrated in a small number of carriers or alliances. See also Brander and Zhang (1990) and Rubin et al. (2005) and Alderighi et al. (2012) for work which supports oligopoly as an appropriate characterization of airline competition.

<sup>10</sup> In the context of the US, this accords closely with reality; for example in 2014, Delta Airlines as one of Georgia's largest and most influential employers, employed approximately 32,000 workers – about 45% of its worldwide labour force – in that state; with most of its Georgia employees in metro Atlanta (Badertscher, 2015; US Bureau of Transport Statistics).

**Figure 1: No Open Skies Agreement; Airline Output and the corresponding benefits to a local jurisdiction with and without subsidy.**



Source: Morrison (2016)

If the jurisdiction provides a subsidy, then the airline's marginal cost declines and its optimal output increases to  $X^*(s_1 = 1)$  which generates a net benefit to the local jurisdiction (indicated by point  $b$ ) equal to  $V(X^* | s_1 = 1) < v(X^* | s_1 = 0)$ . Consequently, the local jurisdiction will choose not to subsidize the airline. By symmetry, the same situation will occur in Country 2.<sup>11</sup>

### 3.2 An Open Skies Agreement

If the two countries sign an OSA that allows the airlines access to each other's market then each market now becomes a Cournot duopoly, however the resulting Cournot Nash equilibria depend upon whether one or both local jurisdictions subsidize their airline. If a local jurisdiction provides a subsidy there is a strategic effect; the subsidized airline's reaction function shifts out. Consequently, the airline's output, profits and economic benefit to its local community in equilibrium depend upon the subsidy decisions of local jurisdictions in both countries.

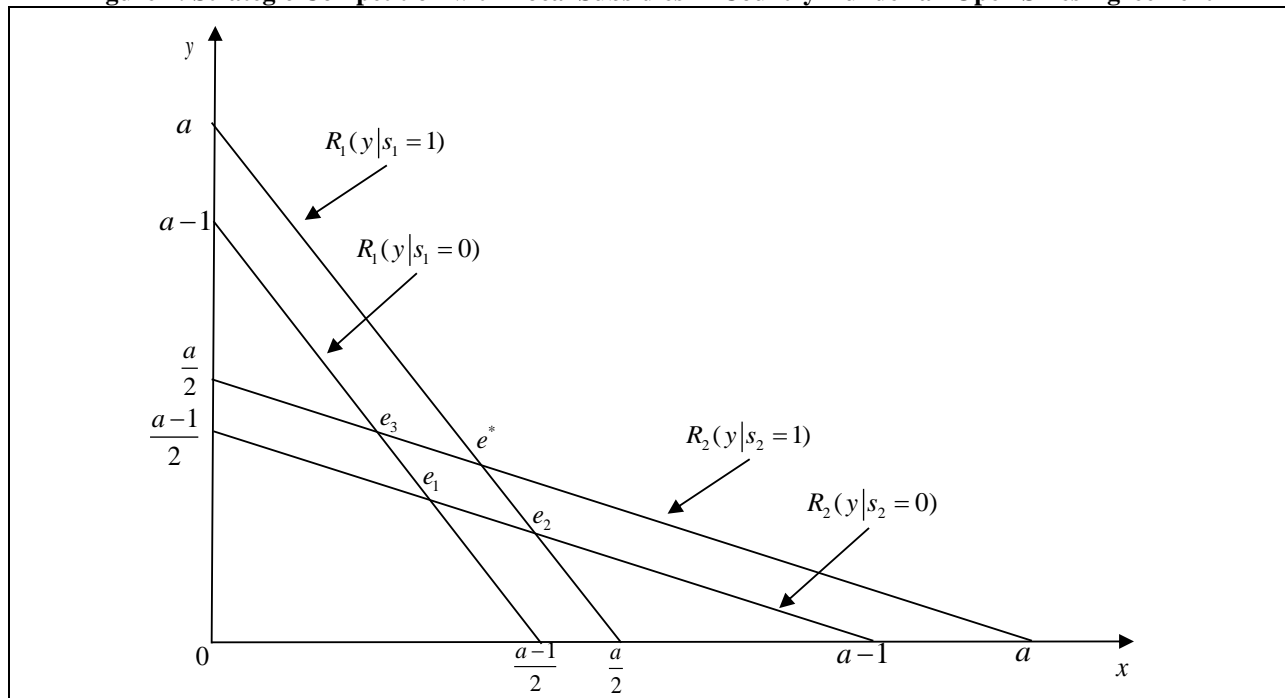
Consider the four possible Cournot equilibria illustrated in Figure 2. At  $e_1$ , neither jurisdiction subsidizes and airline output and profits are equal (the standard Cournot result). If a local jurisdiction does subsidize its airline, the reaction function for that airline shifts out by the amount of reduction in its marginal costs. At  $e_2$  and  $e_3$  only one jurisdiction subsidizes and consequently the output and profits of the subsidized airline increase while the output and profits of the unsubsidized airline decrease relative to  $e_1$ . At  $e^*$  both airlines are subsidized with each airline earning higher profits compared to  $e_1$ . In terms of airline profits, we have the following orderings for Airline 1 and Airline 2 respectively:  $\pi_1(e_2) > \pi_1(e^*) > \pi_1(e_1) > \pi_1(e_3)$  and  $\pi_2(e_3) > \pi_2(e^*) > \pi_2(e_1) > \pi_2(e_2)$  which means (perhaps unsurprisingly) that the airlines prefer to be subsidized in all circumstances. As a result of the firms' strategic competition, local

<sup>11</sup> This result holds for more realistic non-linear economic benefit functions with diminishing returns.



jurisdictions are also now engaged in a strategic subsidy game defined by the four possible Cournot equilibria.

**Figure 2: Strategic Competition with Local Subsidies in Country 1 under an Open Skies Agreement**



Source: Morrison (2016)

Since each local jurisdiction's economic benefit ( $V(X)$ ) is tied to its airline's output, the jurisdictions risk a decline in economic welfare if they do not subsidize their airline. As long as the economic benefit created by an airline in its local jurisdiction is sufficiently large, each jurisdiction's payoffs define a subsidy game (shown below in Figure 3) in which each player (jurisdiction) has a dominant strategy to subsidize its airline ( $s_i = 1$ ) such that the unique Nash equilibrium is at  $e^*$  where both jurisdictions provide subsidies.

In Figure 3, the directional arrows indicate the best responses of each jurisdiction given the actions of the other. The game has a familiar prisoners' dilemma structure such that each local jurisdiction has a dominant strategy to subsidize its airline. The resulting unique Nash equilibrium occurs when both jurisdictions offer subsidies.

The point of the theoretical model is not to suggest that subsidies exist solely as a result of OSAs, but to demonstrate how OSAs that provide increased access to the signatories' markets create strategic pressures to provide government support for each party's domestic airline industry. In this regard the model does not single out the United States but suggests that such pressures exist *on all sides of an OSA*.

**Figure 3: The implied subsidy stage game**

		Jurisdiction 2	
		No Subsidy ( $s_2 = 0$ )	Subsidy ( $s_2 = 1$ )
Jurisdiction 1	No Subsidy ( $s_1 = 0$ )	$V_1(e_1) = V_2(e_1)$ ↓	$V_1(e_3) < V_2(e_3)$ ↓
	Subsidy ( $s_1 = 1$ )	$V_1(e_2) > V_2(e_2)$ ↓	$V_1(e^*) = V_2(e^*)$ ↓

Arrows in the table indicate strategic moves: horizontal arrows from (0,0) to (0,1) and from (1,0) to (1,1); vertical arrows from (0,0) to (1,0) and from (0,1) to (1,1); and a diagonal arrow from (0,1) to (1,1).

$$V_1(e_2) > V_1(e^*) > V_1(e_1) > V_1(e_3)$$

$$V_2(e_3) > V_2(e^*) > V_2(e_1) > V_2(e_2)$$

### 3.3 US state level support for US carriers

The theoretical model above provides a rationale for subsidies at the ‘local jurisdiction’ level when an OSA is signed by postulating that for such jurisdictions, airlines represent a significant source of employment and economic activity. But have state level subsidies actually been observed in the US during the era of its OSAs?

Since 2005, the State of Georgia (home base of Delta Airlines) has granted jet fuel tax exemptions on domestic flights worth millions of dollars. While the original tax exemption was introduced to provide aid to Delta Airlines as it entered Chapter 11 protection, the exemption was repeatedly extended even as Delta Airlines’ financial situation improved and was made permanent in 2012 (Badertscher, 2015). By 2015 the total value of the tax exemption was valued at between 20-23 million dollars annually, mostly enjoyed by Delta Airlines (Badertscher, 2015; Georgia Budget and Policy Institute, 2015).

Similarly, in Dallas where American Airlines is based, state jet fuel taxes are zero (The Tax Foundation, 2014). In United airlines’ hub at Chicago O’Hare, there are jet fuel taxes in the local municipality (Cook County) however United and other commercial airlines are permitted to purchase their jet fuel from offices located outside Cook County thereby avoiding the tax. The value of this tax avoidance loophole in 2013 was estimated at \$34.2 million (Carp, 2015). More generally Stone and Borean (2014) report that:

“There are 19 states that don’t include any jet fuel in their sales tax base [and] 16 that tax private jet fuel purchases but exempt commercial airlines”.<sup>12</sup>

Local jurisdictional aid to airlines is not restricted to jet fuel tax exemptions. In a report prepared for Etihad Airlines, consultancy Risk Advisory cites the following as additional benefits of state-level aid received by the “Big Three” US airlines<sup>13</sup>:

- American/US airlines: Missouri (\$80m, 2003) Pennsylvania (\$26.25m, 2008), Texas (\$6.5m, 2014)
- United/Continental: Colorado (\$6.29m, 2011-12)

<sup>12</sup> Stone and Borean (2014) p2.

<sup>13</sup> Risk Advisory (2015)

- Delta/Northwest: Pennsylvania (\$30m, 2012)

Many of these subsidies were financial inducements to build, expand or refurbish operational facilities located in the state jurisdiction. In the case of Delta Airlines and the state of Pennsylvania in 2012, the airline received \$30 million to enable its subsidiary Monroe Energy to purchase a refinery in a strategy designed to save on jet fuel costs.

Consistent with the theoretical model, these examples support the observation that local jurisdictions have been and continue to be active in providing financial aid to US airlines during a period of time in which the US has been actively pursuing an ‘open skies’ policy. However, we need not restrict our attention to state or local jurisdictions.

#### **4 Producer surplus bias and special interest influence in trade and aviation policy.**

Notwithstanding the incentives for local governments to subsidize an airline based in their jurisdiction, there is also potential for federal government agencies or departments to maintain or even enhance domestic airline subsidies and protections even as international market access expands with the number of OSAs.

The economic literature on trade and protection provides both theoretical and empirical support for the idea that industries which can mount effective lobby groups can influence policy decisions and programs to enhance producer surplus (profits). Theoretical models of interest group influence on trade policy date back to Olson (1965) and Stigler (1976) wherein more concentrated industries face lower costs of coordinating and organizing an effective political lobby group. Rausser and Foster (1990) develop a model of political preferences in which the form of a policy change that is welfare improving overall can nevertheless be designed in different ways that affect the distribution of consumer surplus and producer surplus. In Rausser and Foster’s model, lower organizing costs or greater resources spent on lobbying by producers will skew the distribution of welfare benefits towards producers. A model with more empirical traction is that of Grossman and Helpman (1994). As reported in Gawande and Krishna (2003), the Grossman and Helpman model is a multi-sector specific factor model in which some sectors of the economy are able to influence trade barriers through political campaign contributions. Empirical tests of the Grossman-Helpman model by Maggi and Goldberg (1999) and by Gawande and Bandyopadhyay (2000) provide support for the hypothesis that protection is more likely in industries represented by organized lobby groups.

In research more directly focused on the air transport sector, Brown (2016) measures corporate political activity of US airlines in two dimensions; the amount of resources the firm spends on hiring contract lobbyists and on the airline’s ‘political connectedness’ (the number of individuals with high-level government experience who are hired and retained). Using a sample of 46 airlines over a 15 year period, Brown (2016) finds that lobbying intensity and political connectedness of US airlines are positively related to their profitability.<sup>14</sup>

In summary, economic analysis suggests that a well-organized domestic airline industry will seek access to foreign markets under OSAs but will also lobby for policies and programs which provide subsidies or other forms of protection from foreign competition in order to enhance

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<sup>14</sup> Note that lobbying by US airlines is not restricted to influencing the federal government; Bardertscher (2015) reports that in 2014, Delta Airlines had 12 registered lobbyists in the Georgia State legislature who were active in promoting and protecting jet fuel tax exemptions Bardertscher (2015) also reports on similar lobbying efforts by American Airlines in North Carolina.

profitability. In the following section we provide examples of benefits and protection provided to US airlines during the era of OSAs.

## **5 Federal Subsidies and Aid to US Carriers During the Era of Open Skies**

Long before recent complaints by the ‘big three’ US carriers against Gulf airlines, foreign airlines were complaining about the ‘unlevel playing field’ being created by the US. For example, in 2004 Robert Milton the CEO of Air Canada stated:

“US government assistance to US carriers is much more prevalent and substantial than in Canada or, for that matter, anywhere in the world and includes over \$30 billion in various subsidies, refunds, loan guarantees and post-9/11 industry compensation”.<sup>15</sup>

In this section we highlight three specific examples of federal aid, market foreclosure and producer surplus enhancing policies that have benefited US airlines during the ‘open skies’ era: debt restructuring, the CRAF/Fly America program and antitrust immunity. There is no inference here that OSAs have directly led to the creation of these programs, rather these sources of aid and strategic advantage have coexisted or have co-evolved with the US ‘open skies’ policy.

### *5.1 Debt restructuring under Chapter 11*

In the post-9-11 era, European carriers such as Air France and Lufthansa have continued to struggle with successive labour disputes and strikes in their efforts to arrive at more competitive cost levels. These labor problems clearly contrast with the competitive advantage of US carriers provided by the US Federal bankruptcy law. Whereas in Europe and many other countries around the world, bankruptcy laws primarily seek to reimburse creditors or to protect employees by liquidating distressed companies, Chapter 11 of the US bankruptcy code helps troubled companies to restructure and unload a significant amount of their debts through a reorganization plan. The company’s management continues to run the business, be it that all significant decisions must be approved by the bankruptcy court. Under Chapter 11, US legacy carriers were able to smoothly implement a fundamental transformation of their cost structures, particularly after 2001. Based on 31 airline bankruptcies during the period 1992-2007 Ciliberto and Schenone (2012) observe that as a first step, almost all airlines in their database filed for Chapter 11 protection. GAO (2005) confirms this trend; for airlines, 148 of the 162 bankruptcy filings since 1978 were Chapter 11 filings. Large airlines soon start a reorganization plan; smaller ones often convert the Chapter 11 filing into a Chapter 7 liquidation. Ciliberto et al (2012) also observe that if an airline seeks Chapter 11 protection multiple times, the probability of a revival declines with the number of Chapter 11 filings, as demonstrated by Continental, Pan American, TWA and USAir. The current ‘big three’ US carriers were able to remain under Chapter 11 protection for a substantial amount of time: Delta for about 18 months, American Airlines for two years and United for three and half years.

Airlines are able to cut costs under Chapter 11 in a number of ways. With respect to aircraft, while one might think that a leasing company would simply repossess its aircraft with a customer that has filed for Chapter 11, in fact a lessor can only repossess the aircraft after a 60-day grace period and since repossession requires a redeployment elsewhere, this might be costlier than renegotiating lease payments if industry-wide demand is weak. This gives the airline a strong bargaining position. Furthermore, most legacy carriers under Chapter 11 protection renegotiated or reneged on their defined benefit pension obligations. Only Northwest

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<sup>15</sup> Milton (2004).

Airlines and American Airlines emerged from Chapter 11 keeping their pension plans. The pension obligations burdens of the other major carriers were repeatedly transferred to taxpayers via the Federal Pension Benefit Guarantee Corporation (PBGC) and partly passed on to their own employees. These pension savings amounted to a total of \$17.8 billion as outlined in table 2 below. The total of \$10,420 represent a disproportionate share of the PBGC's unfunded liabilities. Actually, in the period of 1975-2012 air transportation retirees have made \$14,4 billion in claims on the PBGC, thirty percent of all claims paid out (PBGC, 2012).

**Table 2: Airline pension fund obligations passed on to taxpayers and employees (\$ millions)**

<b>Passed on:</b>	<b>United Airlines</b>	<b>Delta Air Lines</b>	<b>US Airways</b>	<b>Total</b>
<b>Taxpayers (PBGC)</b>	\$6,600	\$920	\$2,900	\$10,420
<b>Employees</b>	\$3,200	\$2,080	\$2,100	\$7,380

Source: PBGC press releases on Delta pilots, January 5, 2007; on United Airlines Pilots, December 30, 2004; on other United Airlines groups, April 22, 2005; on US Airways Pilots, April 1, 2003; on other US Airways groups, February 2, 2005.

Chapter 11 also enables a distressed airline to unilaterally modify labor agreements if negotiations with labor unions and employees are stalled. Such a threat once again places the airline in a strong bargaining position. In 2006 the major US carriers have been able to reduce the share of labor in the unit costs from more than 40% to 25% (Tsoukalas et al., 2008).

The compulsory disclosure statements of the various airlines in Chapter 11 reveal that since 2000 substantial amounts of unsecured debt obligations have also been eliminated. In addition, substantial forgiven amounts of capitalized long term debt and lease obligations have been reported in the Security and Exchange Commission quarterly and annual reports. Table 3 summarizes these cost savings resulting from Chapter 11 bankruptcy protection.

**Table 3: Cost savings from unsecured and long term debt elimination (\$ billions)**

	<b>United Airlines</b>	<b>Delta Air Lines *</b>	<b>American Airlines **</b>	<b>Total</b>
<b>Unsecured debt <sup>1)</sup></b>	\$26.5	\$6.6	-	\$33.1
<b>Long term debt <sup>2)</sup></b>	\$8.9	\$10.4	\$5.7	\$25

Sources: <sup>1)</sup> Chapter 11 disclosure statements of various airlines and <sup>2)</sup> SEC quarterly and annual reports

\* Delta + Northwest; \*\* American Airlines + US Airways

All-in all, the current major hub-and-spoke carriers in the US have been able to improve their cost efficiency significantly during their respective Chapter 11 protections. In the US domestic market, unit costs of full service carriers and low cost carriers have been converging while in international markets US full service carriers are now operating at the lowest cost per available seat kilometer compared with Asian, Middle Eastern and European full service carriers (CAPA, 2015b).

## 5.2 *The US Civil Reserve Aircraft Fleet and the “Fly America Act”*

The Civil Reserve Air Fleet (CRAF) program provides the U.S Department of Defense (DOD) with access to a large reserve of commercial airlift capacity, capable of swiftly moving military forces and cargo during times of war. The CRAF program dates back to 1951 and the need to address problems of insufficient air carrier capacity which the US military had experienced during WW II, the Berlin airlift and the Korean conflict. The solution was to

establish a national airlift program in which commercial airlines would dedicate passenger and cargo capacity in times of need.<sup>16</sup>

The CRAF program was utilized for the first time during the Gulf War of 1990-'91 and it became clear that the incentives provided to US commercial airlines were insufficient to ensure their long-term commitment either during war or in peacetime (Lewis, 1998). Consequently, in 1995 any US airline participating in the CRAF was awarded exclusive rights to compete for peacetime government business under the 'City Pair Program', administered by the General Services Administration (GSA).<sup>17</sup> The City Pair Program, which was already in effect in 1995, was created as a result of the 'Fly America' Act (1980) which stipulates that federal government employees and other individuals whose travel is funded by the federal government must fly with specified US carriers. As of 2016, carriers participating in the City Pair Program are Alaska Airlines, American Airlines, Delta Airlines, JetBlue Airlines, Hawaiian Airlines, Southwest Airlines and United Airlines. The GSA contracts with these airlines for discounted fares on pre-specified city pair markets and consequently government funded passengers at any city pair listed under the program (domestic or international) can only be serviced by contracting US carriers. Since the inception of the program there has been significant growth in the number of markets listed; when the program began in 1980 just 11 city pairs were listed but in 2016 this amounted to 9,159 city pairs which, according to GSA, represent an increase of 16% from 2015. While GSA promotes this growth in the program as saving the US taxpayer's money, the program also constitutes a significant market segment in 2,199 international city pair markets from which foreign carriers are excluded. The total contract value for GSA's City Pair Program in 2016 is estimated at \$1.74 billion (GSA, 2015). In addition to the City Pair Program CRAF participants also benefit exclusively from other CRAF related business..<sup>18</sup>

The CRAF program's impact on the competitive position of the U.S. aviation industry is not limited to the competitive distortion from market foreclosures of the Fly America program. More broadly, the CRAF program strongly depends on the financial viability of the participating U.S. airlines. As a consequence, Bowlin (2004) arrives at the following conclusion (due to the financial recovery of CRAF participants he observed in the late nineties):

"...it does not appear that the federal government needs to offer special incentives (such as a reduction in fuel tax) to the CRAF industry to aid the financial viability of the industry."<sup>19</sup>

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<sup>16</sup> Note that this role of US commercial airlines in the national defence system is an important barrier for more flexible ownership and control rules. For example, foreign ownership of U.S. airlines remained limited to 25% during the first stage EU-US Open skies negotiations. Also after the second stage EU-US OSA negotiations the US 25% limit remained unchanged.

<sup>17</sup> The legal basis of the City Pair Program (Fly America Act) originally referred to provisions in the International Air Transportation Fair Competitive Practices Act of 1974. Section 5 provides that when foreign transportation of persons or property is paid for by the US Government, this has to be furnished by U.S. air carriers, whose eligibility is based on CRAF commitments. Minimum CRAF commitments were imposed for the eligibility of Department of Defence peacetime contracts and City Pair Program contracts. For about 60% of the peacetime government business base, a minimum committed percentage of the airline's total long-haul CRAF capacity is required. The remaining 40% of the business base is allocated according to the so-called mobilization value (MV) point system. MV points are awarded to airlines or teams of airlines based on the number and kind of aircraft they commit to each CRAF segment.

<sup>18</sup> Total CRAF business grew from \$705 million in 2001 to a peak in 2010 of \$3.16 billion and decreased to \$2,099 million in 2012 (GAO, 2013). Graham (2003) estimates that about 40% is derived from DOD's passenger and cargo charter business and 60% from the GSA City Pairs Program.

<sup>19</sup> Bowlin (2004), p705.

Ten years later the additional conclusion should be that Chapter 11 has delivered a most important contribution to the reliability of the CRAF program in the 2000's.

One might argue that the revenues earned by US carriers under the City Pair program is justified compensation for their participation in the CRAF. However, the growth in the number of awarded city pairs and total contract value does not correspond with the number of CRAF committed aircraft. Furthermore, the opportunity cost of this DOD compensation in case of CRAF activation can be overestimated if commercial air travel demand implodes during wartime.

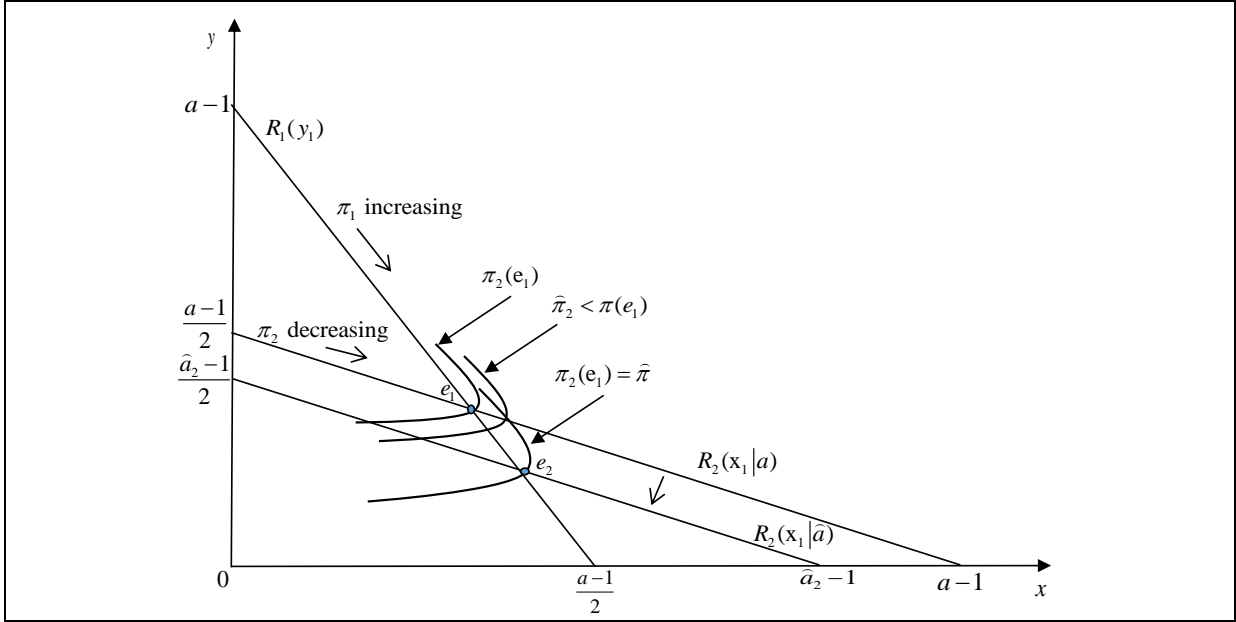
One might also expect that the US 'open skies' policy would place limits on the extent to which the US can insulate this segment of the market from foreign competition. Provisions for allowing US government funded travel to use foreign carriers appear in four of the 120 or so OSAs the US has signed with other countries or regions. The OSAs which address the issue are those with the EU, Australia, Switzerland and Japan. The US-EU agreement, allows federally funded passengers to use EU carriers on routes between the US and EU and on routes from the EU to third countries if code-shared with a US carrier. Condition 1 below however remains applicable. In the other OSAs the use of foreign designated carriers can only occur if all of the following conditions are met:

1. The travel is not funded by the Department of Defence or any other US military department.
2. The traveller is not a member or employee of the US military.
3. The fare is the lowest possible fare (that satisfies the traveller's needs).
4. The travel does not involve one of the 2,199 international markets listed in the City Pair Program.

Thus, even in the liberalized environment of OSAs, the US has managed to protect a large segment of the government funded travel market in favour of its domestic airlines, the effect of which can be viewed through the lens of our theoretical model from section 2. If under an OSA, a country's government is able to 'fence off' a segment of the market that is then only available to the domestic airline, this has the strategic effect of shifting in the reaction function of the foreign airline. Suppose that Country 1 is able to accomplish this in favour of airline 1. With some part of Country 1's market now protected, the market size parameter ( $a$ ) will shrink for Airline 2 and its reaction function shifts in. The resulting Cournot Nash equilibrium defines greater profits for Airline 1 (shared with its government through fare discounts) and lower profits for Airline 2. Figure 4 illustrates the air transport market in Country 1.

In Figure 4 our starting point is the symmetric Cournot Nash equilibrium at  $e_1$ , which occurs when each airline has unhampered access to the other country's market under an OSA. However, if Country 1 is able to exclude Airline 2 (the foreign airline) from a segment of its market then the market size parameter ( $a$ ) shrinks for airline 2 to become  $\hat{a}_2 < a$  and its reaction function shifts in ( $R_2(x_1|a) \rightarrow R_2(x_1|\hat{a})$ ) so that the Nash equilibrium now occurs at  $e_2$ . Iso-profit curves for Airline 2 confirm that  $\pi_2(e_2) < \pi_2(e_1)$ ; its profits are reduced as a result of this policy, while the profits for Airline 1 increase.

**Figure 4: The strategic effect of ‘fencing off’ a segment of the market under an OSA**



### 5.3 Anti-trust Immunity Provisions under Open Skies agreements

As shown in Table 4 below, the granting of antitrust immunity (ATI) to airline partnerships and alliances has evolved hand in hand with the US open skies policy.

**Table 4: Antitrust Immunity Decisions in the USA; 1992-2015**

Year	Anti-Trust Immunity Granting Decisions
1993	KLM-Northwest Airlines
1996	Lufthansa-United Airlines; SAS-United Airlines; Swissair-Delta Airlines; Sabena-Delta Airlines; Austrian Airlines-Delta Airlines.
1999	Alitalia-Northwest Airlines.
2000	Swissair-American Airlines; Sabena-American Airlines.
2001	Austrian Airlines-United Airlines; Lauda-United Airlines.
2002	Air France-Delta Airlines; Alitalia-Delta Airlines; Czech Airlines-Delta Airlines; British Midland Airlines-United Airlines; Finnair-American Airlines; Swiss International Airlines-American Airlines.
2004	SN Brussels Airlines-American Airlines.
2007	Star Alliance (including BMI, Lufthansa and United Airlines)
2008	Skyteam Alliance (including KLM, Air France and Delta Airlines)
2010	Oneworld Alliance (including British Airways, Finnair and American Airlines) Joint venture (British Airways, Iberia, American Airlines)
2013	Delta – Virgin Atlantic - Air France/KLM – Alitalia;
2015	American – Qantas (pending); Delta – Aeromexico (pending)
2016	American – LATAM Airlines Group (pending)

Sources: Gillespie and Richard (2011) and Bilotkach and Hüschele (2013); US Department of Transportation



Antitrust immunity has allowed US airlines and their partners the freedom to cooperatively coordinate capacity, interlining and ticket prices with no involvement or oversight from competition authorities.

Following the first open skies agreement in 1992, KLM and Northwest wanted to implement a cooperative agreement and they applied for anti-trust immunity from the US government which was granted in 1993. Afterwards, KLM and Northwest implemented a ‘metal neutral’ cross-border alliance in which they jointly marketed services that did not depend on which airline supplied the ‘metal’ (i.e. the aircraft). Other ATI applications followed and as more partners joined the three alliances, a consolidation and revision of existing bilateral ATIs was needed.

From 2007 on, the US Department of Transport started to apply an explicit metal-neutral joint venture condition in the approval of the new ATI applications with the stated goal of achieving merger-like efficiencies. ATI also raised the possibility of better international market access for US travellers by enabling the designated airlines to couple their international networks via their hubs. In this way, behind and beyond markets could be opened up through one- or two-stop journeys. Christidis (2016) shows that this policy has been effective for 20 US airports with direct connections to the EU: more than 50% of their US-EU passengers are travelling on connecting flights in the US and/or in the EU. Mifsud (2011) points out that if, under this ATI regime, US carriers are able to establish metal neutral joint ventures with Asian alliance partners separate from such joint ventures with their European partners, “US carriers will find themselves in a unique position in providing access to global aviation networks.”<sup>20</sup>

When firms in oligopoly markets are given the opportunity to coordinate their activities and set prices in consultation with other firms in the industry, economists typically worry about anti-competitive outcomes. Throughout the evolution of immunized partnerships and alliances under OSAs this concern has been voiced by the US Department of Justice, which has routinely opposed the awarding of ATI on the grounds that any efficiency gains are outweighed by elimination of competition.<sup>21</sup> However, the US Department of Transport has ultimate authority to grant antitrust immunity.

Empirical work by Gillespie and Richard (2011) indicates that in the North Atlantic market, the effect of these immunization decisions has been to significantly reduce competition:

“In fact, though over twenty airlines offer trans-Atlantic flights, three groups of antitrust immunized carriers (one within each alliance) combine to carry over 82% of the U.S.-E.U. passenger traffic.”<sup>22</sup>

Gillespie and Richard (2011) find that fares are significantly higher in routes with fewer independent non-stop competitors.

More recent work by Bilotkach and Hüscherlath (2013) find evidence that antitrust immunity has facilitated market foreclosure as the immunized alliance resists carrying non-alliance interline passengers on its network. They estimate that non-alliance airlines carry as many as 11% fewer passengers to the routes of immunized alliance members, while total passenger traffic in the alliance increases by as much as 25% with similar effects on flight frequency. Overall, the evidence to date suggests that antitrust immunity has benefited the major US airlines and their alliance partners at the expense of consumers who have less choice and face higher fares. That is, a loss of consumer surplus has been traded for a gain in producer surplus.

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<sup>20</sup> Mifsud (2011).

<sup>21</sup> See for example United States Government: Department of Justice (2008).

<sup>22</sup> Gillespie and Richard (2011), p1.

#### 5.4 *Antitrust Immunity and the Gulf Carriers Debate*

Understanding the benefits that US airlines have enjoyed and expect as a result of antitrust immunity via OSAs helps put the recent complaints by American, Delta and United Airlines against the Gulf carriers in perspective. The main issue does not concern subsidies that Gulf airlines receive when competing directly against US carriers because there are virtually no OD city pair markets between the US and the Gulf where this occurs (Aviation Economics, 2015). The real issue is the ability of the Gulf carriers to provide sixth-freedom one-stop flights via their hubs between the US and the fast-growing South Asian market (CAPA, 2015a). In these markets, US carriers are predominantly involved in one-stop flights via the hubs of their immunised joint venture partners in Europe. Since non-stop US-South Asia services by US carriers are not a viable option, the key issue in the ‘level playing field’ dispute is that the ‘big three’ feel cut-off from what is likely to become one of the highest growth regions in the world. Although the OSAs between the US and Qatar/UAE allows for sixth freedom operations by the Gulf carriers from any point in the US via their own hubs in the Gulf region, the problem is the second part of the US open skies policy; antitrust immunity based, metal-neutral joint ventures. The Gulf carriers - more specifically Emirates- have adhered to an almost stand-alone network strategy and have not been interested in forging joint ventures with US major carriers. Only Qatar Airways is a non-immunized partner in the Oneworld alliance and a member of the IAG group with BA/Iberia.<sup>23</sup>

Since OSAs also allow for unlimited fifth freedom operations, Emirates has also been able to enter the transatlantic market with the help of the Italian government to serve the Milan Malpensa - New York route. Only this one route seems to provide sufficient reason to plea for a reconsideration of unlimited fifth freedom rights in an OSA with the Gulf States.

Viewed from this perspective, the dispute is that the market access provided by OSAs is not sufficiently attractive for large hub-and-spoke carriers in the US unless intensified cooperation through immunized, metal-neutral joint ventures or alliances are also included.

## **6 Concluding remarks**

The US policy of ‘open skies’ has largely been viewed as a move in the right direction; removing restrictions from pre-existing bilateral agreements, and extending freedoms of the air between signatories to provide enhanced access to markets with the promise of competition that ultimately benefits consumers. However, we have argued that under an oligopoly market structure, OSAs can intensify strategic competition and thus create incentives for each signatory nation to subsidize its domestic airlines to the detriment of foreign carriers and consumers. We have also argued that the US airline industry has been able to organize effective political lobby groups to influence US policy and program design with the result that subsidies and other forms of protection have been maintained or enhanced during the ‘open skies’ era.

Our discussion of these issues places a sharper focus on whether OSAs, as currently crafted by the US, can realize all the potential benefits of truly liberalized markets. What is missing is any mention of cabotage or relaxation of restrictions on foreign ownership. Without these elements, in an environment in which a ‘level playing field’ has never existed, OSAs will continue to support strategic protection.

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<sup>23</sup> Notably, IAG Group did not lend its support to the group of European carriers that are complaining about the Gulf carriers.

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