

5. Beyond Open Skies: The Economic Impact of a US-EU Open Aviation Area

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Although aviation is an enabler of globalization, paradoxically, the airline industry itself remains subject to highly restrictive national controls on cross-border competition and investment. Government-to-government bilateral agreements often limit the routes that international air carriers can fly, the number of flights they can schedule and the fares they can charge. All but a few countries prohibit foreign competition in their internal markets, by banning both the operation of foreign air carriers between domestic points ('cabotage') and cross-border ownership of national airlines. Government signatories to bilateral agreements even restrict cross-border investment in *foreign* carriers through a so-called 'nationality clause' that requires carriers to be 'substantially owned and effectively controlled' by citizens of the country where they are based.

The European Union and the United States have the largest and among the most deregulated domestic aviation markets in the world. However, despite the success of airline deregulation in their domestic markets, Europe and the United States still limit transatlantic competition and investment. To be sure, bilateral 'Open Skies' agreements between the United States and individual EU member states have eliminated most controls on the quality, quantity and price of aviation services, but such agreements still stop short of full liberalization, and major markets are not covered.

As a result of this system, the aviation industry lags in adapting to globalization even as it drives other sectors to globalize. As an editorial in the *Financial Times* put it, "In an era of supposedly borderless markets and global competition, the world airline industry remains stuck in a time warp."¹ This regulatory time warp imposes significant costs on consumers and air carriers alike. And while archaic regulation is not the principal cause of the financial crisis currently confronting major carriers in the United States, Europe and elsewhere, it impedes their long-term recovery.

The European Commission has endorsed the elimination of *all* commercial restrictions on EU-US aviation competition and investment. The Commission's goal is to create a single open market encompassing the provision of air transport services not only between, but also within Europe

¹ "Lowering the Flag", *Financial Times*, June 8, 2000.

and the United States. We refer to this as an ‘Open Aviation Area’ because it would amount to a free trade area in air transport.

To inform the debate, the Commission asked The Brattle Group in 2002 to analyze the economic effects of complete EU-US aviation liberalization.² This chapter discusses the analysis and findings of that study. First, to set the stage, we review the history of transatlantic aviation liberalization and describe the remaining restrictions and their effects. Second, we describe our analysis of the impact that elimination of these restrictions could be expected to have on competition, economic efficiency and consumer welfare. In particular, we estimated the benefits from three sources: i) airline cost savings from increased competition and consolidation, ii) reductions in air fares as a result of improved pricing coordination on transatlantic interline routes and iii) output expansion from replacement of restrictive bilateral agreements. Third, we analyze the merits of concerns raised about the potential impact of US-EU liberalization in three key areas – national security, airline labor and aviation safety. Finally, we summarize recent developments, including last year’s failed US-EU negotiations.

Two caveats are in order. First, our quantitative analysis was limited to the 15 countries that were EU members in 2002, and thus did not include the 10 new EU members that acceded in 2004. The expansion of our analysis to include these 10 countries would increase the economic benefits of a US-EU Open Aviation Area; thus, the numbers reported here are conservative. Second, the numbers reported here were calculated at a time when the currency conversion between the dollar and the euro was almost exactly one to one. Since that time, the dollar has depreciated, and thus the sums reported in euros may be overstated.

To summarize, our quantitative analysis suggests that, over the long term, a US-EU Open Aviation Area would:

- increase transatlantic travel by up to 11 million passengers a year – a 24% increase;
- boost intra-EU travel by up to an additional 35.7 million passengers a year – a 14% increase;
- increase economic output in directly related industries by up to \$8.1 billion a year; and

² See Boaz Moselle et al., “The Economic Impact of an EU-US Open Aviation Area”, The Brattle Group, December 2002.

- create about \$5.2 billion a year in consumer benefits through lower fares and increased travel, with more than half of those benefits going to transatlantic passengers.

To be conservative, we did not try to quantify benefits in the US domestic market. Although we think US domestic passengers will benefit from an Open Aviation Area, the US market is already highly competitive because entry is fully open to domestic carriers, if not to foreign carriers.

Our qualitative analysis finds that claims regarding the potential for international liberalization to harm national security, labor and airline safety do not stand up to scrutiny. Among our conclusions:

- A US-EU Open Aviation Area would not harm national security. If a European entity bought or established a US carrier for business and other reasons, it would operate it as a US subsidiary, and that legal arrangement would preserve Department of Defense leverage. As evidence, foreign-owned, US-incorporated ocean shipping companies have top secret clearance and transport a great deal of US military cargo.
- Nor would US airline labor suffer significant harm. Direct labor substitution would be very limited because of legal and institutional factors that give US pilots considerable bargaining leverage. Although there is greater potential for indirect labor substitution, even that would likely be limited because the US-EU wage gap is so small.
- Creation of an Open Aviation Area poses challenges for US and European regulators, but these challenges are manageable and do not threaten airline safety.

The US-EU Market: Economic Restrictions and Their Effects

Transatlantic Liberalization

Although major impediments to competition remain, air transport between Europe and the United States has been significantly liberalized in the last 25 years. Inspired in part by the success of US domestic airline deregulation, the United States negotiated liberal ‘open market’ agreements in the late 1970s and 1980s with various European governments, beginning with the Netherlands. Belgium, Germany and Luxembourg followed.³ In exchange for

³ See Rigas Doganis, *The Airline Business in the 21st Century*, London: Routledge, 2001, pp. 23-30. ‘Open market’ is Doganis’ term for these agreements.

access to more (but not all) US cities, European governments agreed to let US carriers fly from any point in the United States to specified points in their country. In addition, the agreements eliminated all restrictions on the frequency of flights and the seat capacity on those flights, provided greater opportunities for innovative and competitive pricing, removed restrictions on charter operations and allowed for the designation of multiple airlines. The latter provision was of interest largely to the United States because most other countries had only one international carrier (their so-called ‘flag carriers’).

Predictably, international traffic increased and fares dropped following liberalization. Between 1987 and 1993, the number of passengers traveling on US airlines between the United States and foreign destinations increased by 47%, while domestic traffic increased by only 6%.⁴ (Liberalization had a similar impact within the European Union, where member states had negotiated open-market-style agreements on a bilateral basis.⁵)

By the early 1990s, as a result of structural changes in the airline industry, the limits of open market agreements were becoming more apparent. US airline deregulation and the industry consolidation that followed had produced several carriers with large national networks and a strong commercial orientation. These carriers saw greater opportunities for expansion in international markets than within the more mature US domestic market. And in Europe, where international traffic already constituted a substantial part of flag carriers’ revenue, the trend toward privatization and away from state aid was putting increased pressure on carriers to become self-sufficient.⁶

In response to these factors, the United States and individual European governments in the 1990s negotiated bilateral ‘Open Skies’ agreements that went beyond the earlier open market agreements – in effect, deregulating international travel between the United States and the other country. A typical Open Skies agreement allows carriers from either signatory country to fly to any point in the other country with no restrictions on fares or frequency of service. In addition, carriers receive unlimited fifth freedom (also known as ‘intermediate’ and ‘beyond’) rights – i.e. the right to carry traffic between the other country and a third country. Finally, carriers from

⁴ US General Accounting Office, *International Aviation: Airline Alliances Produce Benefits, but Effect on Competition is Uncertain*, GAO/RCED-95-99, April 1995, p. 2.

⁵ Doganis, op. cit., p. 27.

⁶ Ibid., pp. 30-32.

the two countries can engage in code-share and other commercial arrangements.

Remaining Restrictions

Output-Restricting Agreements

Ten of the 25 EU member states have not signed Open Skies agreements with the United States, and they account for about half of all EU-US traffic.⁷ We refer to the US bilateral agreements with these 10 countries as ‘output restricting’, because they limit to some degree the volume of traffic to and from the United States. The most restrictive agreement is Bermuda 2, which governs US-UK aviation, the largest single transatlantic aviation market. For passenger services, the 1977 Bermuda 2 agreement:

- restricts access to Heathrow, London’s preferred airport, to two airlines each from the United States (currently, American and United) and the United Kingdom (currently, British Airways and Virgin Atlantic);
- limits the number of US cities eligible for non-stop service to and from Heathrow and Gatwick Airports; and
- effectively caps entry in most markets at one US and one UK airline.

In addition, the British government has used Bermuda 2 to limit the number of flights US airlines can offer and to disallow pro-competitive pricing initiatives. All-cargo services between the United States and the United Kingdom operate under a more liberal regime, with no limits on entry, capacity, pricing or which cities can be served in either country. However, fifth freedom operations are restricted to three US airlines and only nine countries.⁸

Bermuda 2 imposes huge costs on UK and US business travelers. Bermuda 2 also imposes major costs on US cargo carriers and the UK shippers they serve. Federal Express, which has its major European hub in Paris, operates daily service from the United States to Stansted Airport outside of London,

⁷ The 10 member states are: Cyprus, Estonia, Greece, Hungary, Ireland, Latvia, Lithuania, Slovenia, Spain and the United Kingdom.

⁸ Under Bermuda 2, US cargo carriers have ‘beyond’ rights only to Belgium, Germany, India, Iran, Jordan, Lebanon, the Netherlands, Syria and Turkey. Thus, they cannot travel from the United Kingdom to many commercially important markets, including France, Italy and Spain in Europe, as well as China, Hong Kong and Japan in Asia.

where it delivers UK-bound express cargo and collects UK cargo outbound for the European continent. Because it does not have fifth freedom rights from the United Kingdom to France, Federal Express must transport the UK outbound cargo to Paris by truck or train, or hire an EU carrier to fly it to Paris. At the same time, Federal Express planes must fly empty from Stansted to Paris.

As another example, under the US-Ireland air services agreement, a US carrier serving Ireland must operate as many flights to Shannon as it does to Dublin (the so-called '50/50 rule'). Irish carriers, in turn, are limited in the number of US gateways they can serve. These restrictions limit air services between the United States and Ireland to the detriment of consumers and air carriers in both countries.

'Open Skies' Agreements

Although Open Skies agreements eliminate all restrictions on output, they retain a number of restrictive features of traditional air services agreements, either by omission or by explicit provision. With respect to transatlantic competition, perhaps the most restrictive feature is the *nationality clause*, which provides that only airlines that are 'substantially owned and effectively controlled' by nationals of the signatory state can operate direct service between that state and the United States. For example, a German-owned airline may operate direct service from Frankfurt to Chicago, but it may not operate direct service from Paris to Chicago. A senior US transportation official recently described the differential impact this provision has on Europe versus the United States:

Consider, first, two different trans-Atlantic aviation route maps as they appear today...The first map shows – with lines connecting every conceivable transatlantic city pair – all of the opportunities currently available to every US airline wishing to fly to Europe...There are some famously anachronistic restrictions at London's Heathrow Airport and some other less important exceptions, but it's still pretty difficult to see the outlines of the continents under the dense tangle of available routes on this first map – the opportunities available to US carriers.

The second map looks very different. It shows the transatlantic city pairs currently available to EU carriers. Instead of the dense tangle of routes we saw on the first map, this map shows a separate spray of routes coming out of each EU country to the United States. The airlines of each of our many EU Open Skies partners are certainly allowed to fly to and from any city in the US, but all those flights must funnel in and out of their individual home countries. At the present time, in other words, no EU carrier has the ability under the current

bilateral agreements to do what every US carrier can do: connect any point in the US to any point in Europe.⁹

The nationality clause is a traditional air services provision that serves the same function as rules of origin in preferential trade agreements – namely, to prevent third countries from obtaining negotiated privileges through the back door. However, by denying European airlines the right to serve US destinations from anywhere in the European Union, this provision thwarts internal European liberalization and integration.

To elaborate, EU flag carriers must base their operations in their home countries, because transatlantic traffic constitutes a substantial part of the revenue of most European carriers. Moreover, it would be difficult for one European flag carrier to challenge a competitor in another EU country, because it could not fly directly to the United States from that country.

The nationality clause is also a barrier to EU consolidation. Restructuring via mergers and acquisitions is one of the key drivers of change in most industries, and the European Commission has indicated a desire to see Europe's airlines consolidate. However, if one of the merging airlines were from a non-Open Skies EU country (and several of the more likely merger candidates are), it is likely that the United States would effectively block the transaction.¹⁰

In sum, the current regulatory regime leads to an 'artificial' proliferation of hubs or mini-hubs in Europe to serve the transatlantic market. At the same time, transatlantic routes are effectively insulated from entry by more efficient competitors from different EU member states. Thus, the current system impedes the evolution of an efficient network design in Europe.

⁹ "International Aviation Priorities", remarks by Jeffrey N. Shane, Under Secretary for Policy at the US Department of Transportation, at Phoenix Sky Harbor International Airport's Aviation Symposium, April 27, 2005.

¹⁰ For example, British Airways explored the acquisition of KLM in 2000. Because the United States had an Open Skies agreement with the Netherlands but not with the UK, US officials made clear that such an acquisition would not give British Airways additional access to the United States through the 'back door' of the Netherlands. More significantly, they cautioned that the merger would cost KLM its longstanding Open Skies rights to the United States. A senior Clinton Administration official announced at the time that "if KLM comes under effective control of British Airways while Bermuda 2 still governs US-UK air services, KLM will immediately lose the benefits of the US-Netherlands Open Skies Agreement". Remarks to the International Aviation Club by Dorothy Robyn, Special Assistant to the President for Economic Policy, National Economic Council, July 18, 2000.

Although airline alliances provide a way around some of these restrictions, they have their own serious limitations.

A second major restriction that persists even under an Open Skies agreement is the statutory limit on *foreign ownership and control of domestic airlines*. Under US law, at least 75% of the voting stock of a US airline must be owned by US citizens, and US citizens must also control the airline. EU law has similar restrictions, although the cap on foreign ownership is higher – 49%. In addition, some EU member states have their own prohibitions on airline takeovers by non-EU investors.

The restrictions on foreign ownership and control also preclude a *right of establishment*. Such a right allows an airline or other investor from one country to establish an airline in another country and to operate it under the laws and regulations of the other country. Thus, although UK entrepreneur Richard Branson would like start up a low-cost airline in the United States and operate it as a US company, he would not be able to control it.

Open Skies agreements effectively preserve a number of other restrictions as well, although their impact on competition is less significant:

- *Stand-alone cabotage*. An airline from one Open Skies country cannot carry domestic traffic solely between two points within the territory of the other Open Skies country. For example, Lufthansa cannot carry US domestic passengers solely between two airports inside the United States. Likewise, a US airline cannot carry German domestic passengers between two airports in Germany.
- *Consecutive ('fill-up') cabotage*. An airline from one Open Skies country cannot carry domestic traffic between two points within the territory of the other, even in the course of providing international service. For example, on a flight from Paris to Mexico City via New York and Chicago, Air France can drop off Paris-originating passengers, and pick up Mexico-bound passengers, in both New York and Chicago; but it cannot carry US domestic passengers solely between New York and Chicago.
- *Wet leasing*.¹¹ US carriers can 'lease-out' US aircraft and crew to foreign carriers, but they are prohibited from 'leasing-in' foreign aircraft and crew. EU carriers do not face such an absolute prohibition, although leasing-in of third-country aircraft is limited to temporary needs and exceptional circumstances.

¹¹ 'Wet leasing' involves the lease of aircraft and crew, in contrast to 'dry leasing', which involves the lease of aircraft without crew.

- *'Fly America' requirements.* Most US government commercial air transport, domestic as well as international, must take place on US airlines. This includes the transport of US government personnel and cargo, as well as most items handled by the US Postal Service. However, on international flights, foreign code-share partners of US-flag carriers can transport US government personnel, cargo and mail under the US carrier's code on routes covered by their code-sharing agreement.

US-EU Open Aviation Area

To remove these market distortions, the European Commission has endorsed the elimination of *all* commercial restrictions on US-EU competition and investment. The resulting US-EU Open Aviation Area would amount to a free trade zone in air transport encompassing not just transatlantic operations but operations within the European Union and the United States as well.

There is support for an Open Aviation Area on both sides of the Atlantic, including among many (although not all) flag carriers seeking greater commercial flexibility. While economists and aviation policy experts generally favor the proposal because it embraces market principles, specific groups, including airline labor unions and some US Department of Defense officials, express serious concerns about key provisions. Moreover, US carriers have been reluctant to battle with their pilots on this issue in the current climate. Largely based on the position of these groups, the US government, despite having blazed the trail on aviation liberalization for more than two decades, has not endorsed significant elements of a US-EU Open Aviation Area.

Economic Impact of an Open Aviation Area

To quantify the benefits of an Open Aviation Area, we focused on three efficiency effects: cost savings, price reductions and output expansion. Using a variety of quantitative methods, we estimated the impact of each effect on prices, passenger traffic volume and consumer welfare.

Economic Benefits of More Efficient Firms Replacing Less Efficient Firms

In a liberalized market, more efficient airlines would replace less efficient ones, or less efficient airlines would adopt the practices of more efficient ones, leading to significant cost savings and an increase in industry efficiency. This substitution would occur through two mechanisms: industry restructuring (e.g. mergers, acquisitions, joint ventures), and increased

competition (e.g. a carrier from one EU country could establish a transatlantic hub in another EU country).

This same process of expansion and consolidation would allow air carriers to exploit size-related economies, leading to further efficiency gains. For example, a merger or ‘deep’ alliance might allow two carriers to spread certain fixed costs over more passengers (scale economy). The carriers might achieve added savings by reconfiguring their combined network to connect more flights to certain hub airports (scope economy). They might also achieve higher utilization – e.g. by combining traffic to raise load factors (density economy).

We used route-level cost data for US and EU carriers to estimate the potential for cost savings under an Open Aviation Area. Our primary source was a database of airline costs and revenues provided by the European Commission’s Directorate General for Energy and Transport and originally commissioned from British Aerospace (BAe). The database estimates airline costs on a route-by-route basis, using essentially the same cost categories used by the International Air Transport Association (IATA). To preserve carrier anonymity and commercial confidentiality, it groups airlines into ‘low’, ‘medium’ and ‘high’ cost categories and presents average costs for each category rather than cost figures for individual airlines.

First, we used these data, together with qualitative industry input, to identify five cost categories for which the variation in costs across airlines was the largest and the potential for network efficiencies the greatest. The categories were: flight deck crew; cabin attendants; passenger service; ticketing, sales and promotion; and general and administrative.

Second, we determined a ‘best practice benchmark’ for these five cost categories. Specifically, we used ‘medium-cost’ airlines rather than ‘no frills’ airlines as our benchmark for industry best practice. It would be unreasonable to claim that traditional airlines could reduce their passenger service costs to those of Ryanair or easyJet, because traditional airlines provide a higher level of in-flight service.

Third, for each cost category, we calculated the savings that would result if high-cost airlines cost were to reduce their costs to the benchmark level. These calculations were done on a route-by-route basis within four geographic regions: the transatlantic, northern Europe, southern Europe and north-south European routes. We limited our comparison to carriers that already served an individual region. That is, we excluded US carriers from our analysis of intra-EU routes, and our analysis of the three intra-EU regions ignored EU carriers that did not already serve that particular region.

Table 1. Estimated Impact of Cost Reductions

	Flight type		
	Intra-EU	Transatlantic	All flights
Current costs (€million/year)	39,531	28,578	68,110
Potential savings (€million/year)	2,268	621	2,888
Percent of current costs	5.7%	2.2%	4.2%

Note: These figures were calculated as of December 2, 2002, when €1 = \$0.9927. Consequently, these figures may be overstated due to currency changes since that time.

Table 1 shows our results. We estimate that the potential cost savings to the airline industry from greater ‘productive efficiency’ are about €2.9 billion annually, or 4.2% of total costs. Nearly 80% of the savings would come from intra-EU, as opposed to transatlantic, operations. We further estimate the impact if these savings were passed through to consumers in price reductions. In addition to the direct benefit of €2.9 billion a year, these savings would produce an annual increase in consumer welfare of as much as €370 million due to the increase in passenger traffic that lower prices would generate.

Economic Benefits of Pricing Synergies owing to Transatlantic Integration

By facilitating deeper forms of integration between US and EU carriers, liberalization would allow improved price coordination on transatlantic interline routes (i.e. routes that require passengers to fly on two or more airlines to reach their destination). Without coordination, each carrier will set the fare for its leg of the flight without considering how it will affect demand for the other legs. If the same carriers are allowed to coordinate, each will have an incentive to set *lower* fares so as to increase combined profits. This process, which seems counterintuitive to many non-economists, is known as ‘elimination of double marginalization’.

We assessed the impact of improved price coordination by interlining carriers in an Open Aviation Area. In particular, we relied on previous studies that examined the fare difference on transatlantic interline routes when the route is covered by an airline alliance, as opposed to no alliance. Economists Jan Brueckner and W. Tom Whalen analyzed fares on US international routes to assess whether alliances result in lower fares on

interline routes as a result of improved price coordination.¹² The authors found that alliance partners charge interline fares that are between 18% and 28% below the prices charged by non-allied airlines on the same route. They concluded that when allied airlines are allowed to share revenues or profits and engage in coordinated fare-setting, consumers benefit from lower interline prices. Moreover, they found that alliances increased consumer welfare overall, even though they may reduce competition, and thus raise prices somewhat on gateway-to-gateway routes.

To produce indicative estimates of these benefits, we made three calculations. First, we calculated fares and volumes for traffic on all transatlantic interline routes not currently subject to price coordination. (We excluded routes covered by the four output-restricting bilateral agreements, because we considered those separately.) To determine fares, we used average passenger revenues for all transatlantic routes as derived from the revenue, volume and load factor information in the BAe database. With respect to traffic volume, we used an industry estimate that around 10% of total transatlantic traffic involves interlining carriers that do not engage in price coordination. We applied this figure to total US-EU transatlantic traffic volumes derived from the US Department of Transportation T-100 data.

Second, we estimated the size of the fare reductions that improved price coordination among transatlantic carriers would produce. We relied on the Brueckner and Whalen results showing that existing alliances have produced fare reductions on interline routes ranging from 18% to 28%.

Third, we calculated the increased traffic volume that would result from these price reductions. We used two estimates of the price-responsiveness (elasticity) of demand – a lower bound estimate of 1.0 and an upper bound estimate of 2.5.

Using these steps, we estimate the gains to consumers that would result if there were comparable fare reductions on transatlantic routes not currently subject to price coordination. Table 2 summarizes our findings, showing an estimated annual benefit to consumers of between €629 million and €1.347 billion, depending on passengers' responsiveness to changes in price (the elasticity of demand).

¹² See Jan K. Brueckner and W. Tom Whalen, "The Price Effects of International Airline Alliances", *Journal of Law & Economics* 43, No. 2, October 2000, pp. 503-545. The majority of the alliances examined in Brueckner and Whalen's analysis were subject to antitrust immunity. International airline alliances may have other, less desirable effects as well. These potential anti-competitive effects of alliances are the subject of ongoing research by Brueckner and by The Brattle Group.

Table 2. Annual Impact of Increased Interline Price Coordination

	Lower bound scenario	Upper bound scenario
Increased passenger volume ('000s/year)	975	5,654
Increase in consumer surplus (€million/year)		
From price decreases for existing customers	571	888
From increased traffic	59	458
Total	629	1,347

Note: The lower bound scenario assumes an 18% price reduction and a price elasticity of demand of 1.0, while the upper bound scenario assumes a 28% price reduction and a price elasticity of demand of 2.5.

Economic Benefits of Eliminating Output Restrictions

At least three mechanisms would lead to expanded output (passenger traffic) in a liberalized market. First, cost savings from the first two efficiency effects described above would be passed through to consumers (at least in the long run) in the form of lower prices, leading to increased passenger demand for travel. Second, price reductions resulting from improved price coordination on transatlantic interline routes would increase demand. Third, US bilateral agreements with Greece, Ireland, Spain and the United Kingdom all restrict output to varying degrees; an Open Aviation Area would eliminate these restrictions. (Recall that our analysis did not include the ten newly acceded EU members, six of which have output restricting agreements with the United States.)

We estimated the impact on airline industry output of liberalizing those four 'output-restricting' bilateral agreements. Our methodology involved estimating the impact of prior, 'partial' transatlantic liberalization – namely the Open Skies agreements of the 1990s. Specifically, we estimated the impact of these Open Skies agreements by using statistical techniques to analyze historical data on passenger traffic as well as market cost and demand variables. By controlling for these economic variables, we isolated the contribution of Open Skies agreements to changes in the volume of transatlantic passengers over time. We used this result as a lower-bound estimate of the output expansion that would accompany the replacement of the four output-restricting bilateral agreements in an Open Aviation Area.

Our analysis found that, controlling for other factors, the 1990s Open Skies agreements led to a 10% increase in the number of transatlantic passengers. To estimate the impact of liberalizing the four remaining output-restricting bilateral agreements, we simply extrapolated from that result, as shown in Table 3. By this measure, an Open Aviation Area would lead to an additional 2.2 million passengers traveling annually between the United States and Greece, Ireland, Spain and the United Kingdom. As Table 4 shows, the corresponding impact on consumer welfare would range from €0.6 billion to €1.5 billion a year.

Table 3. Estimated Volume Increases from Lifting of Output Restrictions for Non-Open Skies Countries

Country	Actual volume in 2000 ('000s) [1]	Predicted % increase from open skies agreement [2]	Predicted volume in 2000 ('000s) [3] = (1+[2]) x [1]	Change in volume in 2000 ('000s) [4] = [3] - [1]
Greece	342	10%	377	35
Ireland	1,587	10%	1,748	161
Spain	1,825	10%	2,011	185
UK	17,810	10%	19,617	1,807
Total	21,564	10%	23,753	2,188

Source: DOT International T-100 Data.

Table 4. Predicted Increase in Consumer Surplus due to Lifting of Output Restrictions (€ million/year)

Country	Lower bound scenario			Upper bound scenario		
	Gain due to price decreases for existing customers	Gain due to increased traffic	Total gains	Gain due to price decreases for existing customers	Gain due to increased traffic	Total gains
Greece	18	1	19	8	0	8
Ireland	95	5	99	39	2	41
Spain	106	5	112	44	2	46
UK	1,181	58	1,239	486	24	510
Total	1,401	69	1,469	577	29	605

Notes: Calculated for routes where volume and bi-directional fares are both available.

Utilities January 2001 fares.

The lower bound scenario assumes an elasticity of 1.0, while the upper bound scenario assumes an elasticity of 2.5.

These labels are used to be consistent with the rest of the analysis, even though the assumptions behind the two scenarios result in greater gains in the lower bound scenario than in the upper bound scenario.

Source: DOT International T-100 Data and BAe Database.

Total Economic Impact

Combining the results from Tables 1 through 3, we developed indicative estimates of the total economic impact of an Open Aviation Area on two key measures: passenger traffic volume and consumer welfare.

As Table 5 shows, we estimate that passenger traffic would increase annually by between 4.1 million and 11.0 million passengers on transatlantic routes, and between 13.6 million and 35.7 million on intra-EU routes, for a total increase of 17.7 million to 46.7 million passengers per year. *These are significant increases. They represent an increase of 9-24% in total transatlantic travel, and 5-14% in intra-EU travel.*

Table 5. Total Estimated Increase in Passenger Volume ('000s/year)

Effect	Area	Lower bound scenario	Upper bound scenario
Cost savings	Transatlantic	968	3,169
Price synergies	Transatlantic	975	5,654
No output-restricting bilaterals	Transatlantic	2,188	2,188
<i>Subtotal</i>		<i>4,131</i>	<i>11,011</i>
Cost savings	Intra-EU	13,527	35,720
Total		17,658	46,731

As Table 6 shows, we estimate that an Open Aviation Area would increase consumer surplus by a large amount – from €5.1 billion to €5.2 billion annually.¹³ Transatlantic traffic accounts for €2.7 billion to €2.8 billion, or just over half of that increase. The lion’s share (€3.1 billion to €3.8 billion annually) comes from gains to consumers that do not involve any reduction in airline profits.

We also quantified the impact of an Open Aviation Area on industries that supply direct inputs to aviation, such as aircraft and computer equipment. As Table 7 shows, we estimated that the increased airline revenue would lead to additional economic output in ‘directly-related’ industries ranging from €3.6 billion to €3.1 billion a year. Note that this figure excludes any of the

¹³ For Table 5 through Table 7, the lower bound scenario represents an assumed elasticity of 1.0, while the upper bound scenario represents an assumed elasticity of 2.5. For the price synergies results, the lower bound scenario also assumes an 18% price decrease, while the upper bound scenario assumes a 28% price decrease.

potential impact on industries such as tourism and leisure that would be among the most significant beneficiaries of aviation liberalization.

Table 6. Total Estimated Increase in Consumer Surplus (€ million/year)

Effect	Area	Lower bound scenario			Upper bound scenario		
		Gain due to price decreases for existing customers	Gain due to increased traffic	Total gains	Gain due to price decreases for existing customers	Gain due to increased traffic	Total gains
Cost savings	Transatlantic	621	41	662	621	158	778
Pricing synergies	Transatlantic	571	59	629	888	458	1,347
No output-restricting bilaterals	Transatlantic	1,401	69	1,469	577	29	605
Subtotal		2,592	168	2,760	2,085	645	2,730
Cost savings	Intra-EU	2,268	83	2,351	2,268	216	2,483
Total		4,860	251	5,111	4,353	860	5,213

Table 7. Revenue Impact on Directly-Related Industries (€ million/year)

Effect	Lower bound scenario			Upper bound scenario		
	Revenue	Direct economic impacts	Direct-plus indirect economic impacts	Revenue	Direct economic impacts	Direct-plus indirect economic impacts
Pricing synergies	571	571	1,053	2,908	2,908	5,365
No output-restricting bilaterals	1,401	1,401	2,584	1,484	1,484	2,738
Total	1,971	1,971	3,637	4,392	4,392	8,103

Potential Impact of Liberalization in Three Key Policy Areas

Opponents of international aviation liberalization argue that it will have an adverse impact in at least three areas – national security, airline labor and aviation safety. Below, we analyze the merits of these claims in the context of a US-EU Open Aviation Area.

Would an open aviation area jeopardize US national security?

Some in the US Department of Defense (DOD) are concerned that international aviation liberalization could threaten the Civil Reserve Air Fleet (CRAF), a critical component of America's military readiness. Under the CRAF program, US commercial air carriers pledge to provide military airlift in a defense emergency in exchange for exclusive access to US government peacetime business. DOD officials fear that allowing foreign investors to acquire US air carriers would jeopardize the military's dependable access to this emergency capability. DOD concerns rest on three assumptions:

- US air carriers are more dependable than foreign air carriers.
- If a foreign entity bought a US air carrier, it would operate as a foreign carrier.
- If the US government changed its *statutory policy* to allow foreign ownership of US carriers, it would open itself up to problematic *transactions*.

The first assumption is generally valid. US carriers *are* more dependable because the US government has legal leverage over them (it could revoke the operating certificate of a non-compliant CRAF carrier, seize the aircraft and call up the carrier's reservist-pilots to fly them, etc.). The US government's leverage with foreign carriers is far more limited.

However, the second assumption is flawed. Legal requirements and business strategy almost certainly would compel the European buyer of a US carrier to operate it as a US subsidiary, giving the US government the identical leverage. The alternative – operating as a European carrier in US domestic commerce – would amount to stand-alone cabotage. Cabotage operations on that scale would be highly impractical from a commercial standpoint. In addition, most US aviation law experts believe that, even if the statutory restriction on stand-alone cabotage were eliminated under an Open Aviation Area, a foreign carrier operating in US domestic commerce would be subject to all of the laws and regulations that apply to other US-based companies.¹⁴ In sum, because the European buyer of a US carrier would (by choice or mandate) exercise its right of establishment, DOD's dependable access to the aircraft would be preserved.

¹⁴ Presumably, the same logic would apply to a US carrier operating in European domestic commerce. The legal argument would not necessarily extend to the transport of domestic traffic as part of international service (i.e. consecutive or 'fill-up' cabotage).

Only one scenario would put CRAF aircraft at risk – if a US carrier (whether US- or foreign-owned) re-flagged its international operations to Europe, presumably to substitute lower-wage EU pilots. But this scenario is unlikely, and there are ways to preclude it.

As evidence that this approach (i.e. US incorporation under a right of establishment) protects national security, DOD already allows participation by foreign-owned commercial vessels in its Voluntary Intermodal Sealift Agreement (VISA) program – the maritime equivalent of CRAF – and the closely linked Maritime Security Program (MSP). Much of VISA and MSP capacity comes from ships that meet US ‘citizenship’ requirements and fly the US flag despite being foreign-owned. For example, the Danish-owned, Norfolk-based Maersk Line, Limited has top-secret clearance and transports half of all DOD’s peacetime maritime cargo.

The third assumption also is flawed. Even if it were to allow foreign ownership of US carriers, the US government still could block or restrict individual transactions, using the Exon-Florio amendment to the Defense Production Act. Under Exon-Florio, an interagency executive-branch Committee on Foreign Investment in the United States (CFIUS) reviews foreign mergers solely to determine if they would harm US national security. Since 1988, CFIUS has imposed conditions on a number of transactions to protect US national security.

A second DOD concern is that elimination of market access restrictions (Fly America requirements and the ban on cabotage) would make the CRAF program more costly. Because CRAF is financed indirectly, by giving participating carriers exclusive access to the market for US government air transport services, it requires no direct funding. Economists have long criticized cabotage and Fly America restrictions: by excluding foreign carriers from the US government market, they impose direct and indirect costs on users. On balance, the US government would *save* money if it paid US carriers directly to participate in CRAF and opened the government market to all qualified carriers. As noted above, however, stand-alone cabotage is impractical for legal and business reasons. Moreover, elimination of Fly America requirements may be politically impractical in the near term, because it would require the US Congress to appropriate money for a program that is currently ‘free’ in budgetary terms. If Fly America restrictions were maintained, it would diminish somewhat the benefits of an Open Aviation Area, but European carriers could get around that restriction by exercising their right of establishment.

We conclude that a US-EU Open Aviation Area would not jeopardize the CRAF program or US national security more broadly.

How would an open aviation area affect workers and wages?

Economic theory tells us that by liberalizing trade and investment in aviation, an Open Aviation Area could facilitate the substitution of less expensive foreign workers for more expensive domestic workers ('labor substitution'), either directly or indirectly. In fact, a major impediment to US-EU liberalization is the concern by labor groups that US pilots and flight attendants would be replaced by lower-wage EU flight crew on transatlantic flights. US pilots point to two scenarios that are of particular concern. The first is a US-EU merger: for example, if Delta were to buy Aer Lingus and substitute Irish pilots on transatlantic flights. Under the second scenario, a US carrier would re-flag some or all of its transatlantic operations to, say, Portugal – what labor groups refer to as flying a 'flag of convenience' – so as to substitute lower-wage EU flight crew.

Based on a comparison of US-EU wage differences and an analysis of legal and institutional barriers to labor mobility, we draw three conclusions. First, *the potential for direct labor substitution appears to be very limited*. Under US immigration law, US carriers cannot avoid using US flight crew for their domestic operations, which account for nearly 75% of their total revenue. This gives US pilots significant bargaining leverage with which to prevent US carriers from engaging in direct labor substitution. US pilots have already negotiated protection against the comparable risk associated with international alliances and other international operations, and that process will only accelerate as the prospects for liberalization improve. Moreover, pilots are organizing themselves in parallel with the cross-border airline alliances, and these international pilot alliances will thwart airline efforts to introduce competition in aviation labor markets.

In addition, the lack of significant US-EU wage disparity would limit the appeal of direct labor substitution for US carriers under an Open Aviation Area. Pilots and flight attendants at major airlines in the EU15 member states earn only about 15% less than their US counterparts. There is, however, a far wider wage gap between US flight crew and their counterparts in the 10 member states that acceded in 2004. Still, these countries have relatively few qualified pilots, and it is expensive to train new ones. Moreover, because new member state pilots are scarce and well-informed, their wages will converge with those of other pilots in a competitive market.

Second, *the potential for indirect labor substitution is greater*, by comparison – particularly over the long run. Under this scenario, relatively lower-wage transatlantic carriers such as Virgin Atlantic would take market share from high-wage US and EU carriers. *But, even here, any adverse impact on US labor would be limited* because US and EU wage levels, which are not that far apart to begin with, will converge in a competitive market.

Third, *the pejorative discussion of ‘flags of convenience’ in the context of US-EU aviation liberalization is fundamentally misleading.* The checkered history of open-registry vessels in the maritime industry, which opponents of liberalization often cite, has limited relevance for an Open Aviation Area. US carriers are unlikely to re-flag for the reasons cited above, and high-wage EU carriers are equally unlikely to re-flag for a different reason: they can hire workers from lower-wage EU countries even without re-flagging. Finally, even if re-flagging were to occur under an Open Aviation Area, it would not pose a threat to airline safety or labor conditions, given the high standards in place in Europe and the United States.

Although our analysis suggests that airline workers would not be harmed seriously by liberalization, it nevertheless may be desirable to cushion them against possible losses under an Open Aviation Area. Policy-makers should avoid policies that distort competition (e.g. mechanisms to preclude re-flagging). Far preferable are policies that directly compensate dislocated workers, although policy-makers would have to make a credible commitment to honor such policies.

Would an open aviation area harm airline safety?

Western Europe and the United States have aviation safety records that are (in the words of safety expert Arnold Barnett) “astoundingly close to perfect”. In part, these records reflect the strength of government regulatory systems that subject aviation to a higher level of safety scrutiny than that received by any other industry. US and European safety systems are part of a longstanding international regulatory regime that has proven highly effective in those parts of the world where it is fully implemented. Most important:

- The International Civil Aviation Organization (ICAO) develops and disseminates detailed international standards covering every aspect of aviation.
- Member countries, through their national or regional civil aviation authority (CAA), apply and enforce ICAO standards. Specifically, CAAs are responsible for the safe operation of air carriers that bear their nation’s flag.

More recently, the United States and ICAO have begun formal programs to assess whether third-country CAAs comply with ICAO standards. Regulators in the United States and elsewhere use the results of these assessments to limit or deny access to their national airspace by carriers from non-compliant countries.

Although a US-EU Open Aviation Area would not alter the strong regulatory structure in place in Western Europe and the United States, proposals for

international liberalization, generally, have raised concerns from labor groups and questions from aviation regulators at the US Federal Aviation Administration (FAA).

Labor groups warn that increased international competition could force carriers to cut spending related to safety. US airline deregulation prompted similar concerns in the late 1970s and 1980s. However, extensive research found no evidence that deregulation had any adverse impact on safety, and the US accident rate improved during deregulation roughly in line with long-term trends. A second concern is that practices fostered by globalization (e.g., international code-sharing) make it easier for carriers to avoid national regulatory oversight. While these practices do make safety regulation more complex, an Open Aviation Area would pose no new or added risk.

Most FAA officials view international liberalization as an issue that should be decided on the basis of economic policy, not safety, considerations. However, they urge that liberalization be carried out in a way that preserves or enhances safety. One issue is how to handle operations by EU carriers inside of the United States under an Open Aviation Area – primarily, fill-up cabotage or wet leasing that is cross-border in nature. Under international rules, those operations would be the regulatory responsibility of European authorities; but FAA officials worry that Congress would impose direct FAA oversight, subjecting the operator to two regulatory standards. As an alternative to having no oversight or direct oversight, the FAA might certify such operations using its Bilateral Aviation Safety Agreement, a mechanism currently used to facilitate reciprocal certification of aircraft and aeronautical products. A second FAA issue concerns international flights to and from the United States under an Open Aviation Area. The key is to preserve aviation authorities' ability to know precisely who has operational control of, and regulatory control over individual flights.

In sum, although an Open Aviation Area would challenge regulators, it would not harm aviation safety, given the generally high level of regulatory oversight in Europe and the United States. Globalization of aviation is unavoidable. Aviation authorities in the United States and Europe are devoting ever more time and resources to dealing with the international dimensions of regulatory oversight. US-EU aviation liberalization would focus and accelerate this important effort. In the end, that could be one of the most valuable contributions of an Open Aviation Area.

Recent Developments

Although creation of a US-EU Open Area remains a seemingly distant goal, a great deal has happened since our study was published in early 2003. The precipitating event was a November 2002 ruling by the European Court of

Justice (ECJ). In a group of cases brought by the European Commission against selected member states, the ECJ ruled that the nationality clause was a violation of the Treaty of Rome, and told the member states in question to remove the clause from their bilateral agreements. In June 2003, after months of internal debate, member states granted the European Commission its long-sought mandate to negotiate international air services agreements on their behalf, albeit with certain restrictions. That same month, at the US-EU Summit, President Bush and his EU counterparts announced the start of comprehensive air services negotiations.

A year later, following six formal rounds of talks, the European Commission and the US government reached a major agreement that stopped short of an Open Aviation Area but that nevertheless went beyond traditional Open Skies. The agreement eliminated most of the remaining restrictions on US-EU aviation competition, with the notable exception of the prohibition on foreign ownership and control, which also precludes a right of establishment.¹⁵ Most important, the agreement replaced the problematic nationality clause with an 'EU carrier clause'. In addition to resolving member states' internal legal problem, that clause was intended to facilitate consolidation of the fragmented EU airline industry. The agreement also replaced all of the existing bilateral agreements with a single EU-wide Open Skies agreement, thus extending the Open Skies model to the 10 EU member states that do not have such an arrangement with the United States. In addition, the agreement opened up Heathrow Airport to all US carriers, although it did not provide any takeoff or landing slots.

Despite the European Commission's strong support for the agreement, it was rejected in June 2004 by the EU Transport Ministers, whose approval was required. Not surprisingly, the UK was the most vocal objector, but several member states with Open Skies agreements also opposed the agreement. The naysayers maintained that granting the US its major wish – greater access to Heathrow – would leave them little leverage to induce for the United States to return to the table later and negotiate access to its domestic market. However, in a speech delivered a month later, John Byerly, a senior official at the State Department who led the US delegation, left little doubt that the

¹⁵ Shortly before it reached an agreement with the Commission, the Bush Administration proposed legislation to raise the cap on foreign ownership from 25% to 49% of voting stock, but that proposed change, which met with only limited support in Congress, would have had little practical effect without a simultaneous change in the prohibition on foreign control. The agreement also left the prohibition on cabotage in place, although that restriction, in contrast to the limitation on foreign ownership and control, has little commercial effect.

real impediment was continued protectionism on the part of British Airways, Lufthansa and several other European carriers:

Publicly, the Association of European Airlines had long called for a Commission mandate and for EU-wide negotiations with the United States. Privately, however, individual European carriers – many of which enjoy protected positions on international routes to third countries negotiated by their national governments – expressed concern that the Commission might pursue a more independent course, one that could work to their commercial disadvantage. Why, they implied, should member states give the Commission an early win that could only bolster its quest to negotiate market-opening agreements with other countries?¹⁶

The European Commission was also stung by the no vote. (According to Byerly, the Commission's Minister for Energy and Transport, Madame Loyola de Palacio, complained publicly about some European carriers' desire to maintain 'closed market shares' that make 'victims' of consumers.) However, the Commission remains intent on getting an agreement. In an effort to put pressure on the member states, the Commission recently ordered 11 European countries to renounce their bilateral agreements with the United States, in keeping with the ECJ's 2002 decision.

The Bush Administration is sympathetic to the Commission's agenda: in a recent speech, a senior DOT official all but endorsed elimination of restrictions on foreign ownership of US airlines.¹⁷ However, the Administration does not yet appear ready to expend the political capital necessary to secure congressional support for that long-overdue change in the law. Thus, as much as the United States would like to conclude the 2004 agreement, it is reluctant to restart talks without some guarantee of success.

Despite the seeming stalemate, support for a US-EU Open Aviation Area is growing, slowly but surely. The issue has been studied and debated extensively in the last several years on both continents, and supporters and

¹⁶ "US-EU Aviation Relations – Charting the Course for Success", remarks to the International Aviation Club by John R. Byerly, Deputy Assistant Secretary for Transportation Affairs, US Department of State, July 13, 2004.

¹⁷ Remarks of Jeffrey N. Shane, *op. cit.* Shane said that "the one industry in which capital is not allowed to flow freely across national boundaries, ironically, is the very industry that has facilitated the globalization of all the others – commercial aviation. It does not seem radical in 2005 to suggest that it is time to reconsider the justification for a law that restricts US airlines' access to the global capital marketplace."

opponents are gradually finding common ground.¹⁸ If a European ‘white knight’ were to express interest in a financially troubled US carrier, it is likely that Congress – presumably with support from US airline labor – would amend the foreign ownership law in short order to make the rescue possible. Absent this scenario, which does not seem likely, complete liberalization may still be several years away. But it is increasingly seen as inevitable.

¹⁸ As one illustration, an American Bar Association (ABA) working group recently reached unanimous agreement to recommend elimination of statutory restrictions on foreign ownership and control of US airlines subject to three (admittedly controversial) conditions that are designed to deal with national security and labor concerns. Four years earlier, a similar ABA working group was unable to reach any consensus because of disagreements over the implications of a change in the law for national security and labor. “Working Group Position Statement on Relaxing Airline Foreign Ownership Restrictions”, *The Air & Space Lawyer*, Winter 2005.