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VIA HAND DELIVERY

Mr. Andrew J. Heimert
Executive Director and General Counsel
Antitrust Modernization Commission
1120 G Street, N.W.
Suite 810
Washington, D.C. 20005

Dear Mr. Heimert:

Enclosed please find a hard copy of the comments of United Air Lines, Inc. submitted in response to the Commission's request for public comments (Fed. Reg. 28,902). An electronic copy of the comments has separately been emailed today to your colleague, Bill Adkinson.

If there are any questions about this submission, please contact me at (202) 663-6589.

Very truly yours,

Ali M. Stoeppelwerth

Ali M. Stoeppelwerth

Enc.

cc: Ricks P. Frazier
Julie Oettinger

Comments of United Air Lines, Inc.
to the Antitrust Modernization Commission:
Merger Review in the U.S. Airline Industry
March 8, 2006

I. Introduction

It is no secret that the U.S. airline industry is struggling financially. As the Department of Justice's Antitrust Division ("DOJ") itself has recognized, one part of the solution to this problem is likely to be consolidation among industry participants. Indeed, this process has already begun in Europe and Asia among some of the U.S. airlines' strongest competitors. Unfortunately, however, DOJ's approach to antitrust issues in the airline industry has often caused it to overestimate the competitive problems with, and to underestimate the competitive benefits of, airline mergers. Indeed, DOJ's treatment of airline mergers stands in sharp contrast to its approach to acquisitions in other industries. As a result, the restructuring necessary to enable U.S. carriers to compete both domestically and on a global scale with growing competitors in Europe and Asia has been forestalled.

II. Statement of United Airlines' Interest

United Airlines appreciates the opportunity to submit its views on the Department of Justice's review of mergers in the airline industry. Founded in the 1930's, following the merger of several fledgling airlines, United now employs 55,000 individuals and operates over 3,500 flights a day to 193 destinations in the U.S. and abroad out of its primary hubs in Denver, Chicago, Los Angeles, San Francisco, and Washington, DC. Through its alliance partners, United offers connections for its passengers to nearly 800 destinations worldwide.

As this country's second largest international carrier (as measured by revenue passenger miles), United has a unique perspective on the global competitive challenges that face U.S.

airlines. Just as market conditions in 1931 necessitated the merger that created United, so different economic circumstances create the need for competitive responses in the current marketplace. In 2000, in response to growing domestic competitive pressure from other major network carriers and low cost carriers and to better position itself against heightened international competition, United and US Airways proposed to merge. In July of 2001, the DOJ announced its opposition to this union. Although the parties presented strong evidence that the merger would have substantial procompetitive benefits, DOJ did not take all of these efficiencies into account in its analysis of the transaction. Both US Airways and United filed for bankruptcy protection following their failed merger attempt. The two companies have been successfully reorganized, but at an economic cost to suppliers, creditors, employees, shareholders and the U.S. government in multiple billions of dollars through processes managed by the federal court system under the Bankruptcy Code rather than through market-driven efficiencies.

III. Restructuring Is Necessary to Allow U.S. Network Airlines to Compete Domestically and Globally

A Healthy U.S. Airline Industry Requires Healthy Network Carriers

Commercial aviation is an industry characterized by high fixed costs and relatively low variable costs. Profitability depends on obtaining a critical mass of passengers on a particular route. As traffic density on a given route increases, the incremental cost of carrying an additional passenger falls. How to achieve sufficient traffic density, then, is the question that must be answered by any successful commercial aviation business plan. The "answer" provided by the network airline model offers important collateral public benefits for domestic and international travelers.

At the onset of airline industry deregulation in 1979, most U.S airlines adopted a model commonly referred to as the "hub and spoke" system. Under this approach, carriers feed traffic

from "spokes," including smaller, less trafficked airports, into "hubs," larger airports located in major U.S. cities. While hubs serve as points of connection between smaller city pairs, their primary purpose is to collect large numbers of passengers with different points of origin into a central location for travel to a common destination. This arrangement creates "economies of density" for the network carrier by allowing the use of larger, more efficient aircraft and more intensive use of aircraft ground facilities through more frequent flights.[1]

Because network carriers rely on small and medium airports to "feed" passengers into their hubs, they have a strong economic interest in serving these markets and providing passengers with efficient access to the larger network. In fact, maintaining and potentially expanding service to smaller, regional airports is integral to the health and competitiveness of network carriers on a global scale. Concentration of traffic into hubs is necessary to achieve the passenger densities required to profitably maintain international service to Asia, Europe, and other destinations across the Pacific and Atlantic. By contrast, the point-to-point model of the so-called low-cost carriers primarily involves choosing profitable markets on the basis of the existing density of local demand in that market instead of creating network effects (or serving less popular destinations). To date, these point-to-point carriers have generally lacked interest in smaller, less inherently profitable routes, in contrast to their aggressive entry on larger, denser routes.[2]

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[1] Jan K. Brueckner, *Economies of Traffic Density in the Deregulated Airline Industry*, 37 J. L. & Econ. 379, 414 n.3 (1994).

[2] For example, United (through United Express) serves Appleton/Madison Wisconsin from Chicago (O'Hare); none of the point-to-point carriers serving Chicago (Midway) offers that service. Instead, the point-to-point carriers tend to focus on more populous destinations like Denver and New York City.

Having vibrant global carriers headquartered in the United States also serves a number of important national interests, including maintaining U.S. jobs, preserving a significant source of tax revenues, and retaining primary safety oversight for airlines who carry significant numbers of Americans worldwide.[3] While some point-to-point carriers operate regional international flights within the western hemisphere, primarily to Canada and high traffic vacation destinations in Mexico and the Caribbean, they have made little effort to enter long-range intercontinental markets where the use of wide-bodied aircraft is essential. Maintaining the benefits of U.S.-headquartered international airlines depends, therefore, on retaining American network carriers.

Healthy networks provide other significant consumer benefits. For example, travelers on connecting flights generally prefer making "online" connections (on the same airline) as opposed to "interline" connections (between different airlines), which are more likely to involve changing terminals or rechecking baggage at the connection.[4] Broader networks allow the use of frequent flyer miles to a wider number of destinations, and raising traffic density increases flight frequencies and/or aircraft size.

U.S. Network Carriers Face Significant Economic Challenges

The economic challenges presently facing U.S. network carriers jeopardize these consumer benefits. Given skyrocketing fuel prices and competition from point-to-point carriers with substantially lower costs (which, in most cases, result from their relatively short time in

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[3] Hub and spoke networks also provide substantial social and economic benefits by allowing businesses to be more efficient and productive, and by encouraging higher investment. Int'l Air Transp. Assoc., IATA Economics Briefing No. 3: Airline Network Benefits (January 2006) at 5 (a copy of this study is attached).

[4] Gustavo Bamberger, Dennis Carleton, Lynette Neumann, *An Empirical Investigation of the Competitive Effects of Domestic Airline Alliances*, 47 J. L. & Econ. 195, 198 (April, 2004).

business and their operating model[5]), restructuring is vital for network carriers to reduce costs and compete successfully on both domestic and international routes.

Competition has sharply reduced the fares paid by consumers. Since deregulation, average airfares, when measured in constant dollars, have dropped by over 55% between 1975 and 2000.[6] Even business fares, traditionally seen as resistant to price pressure because business travelers are less flexible in timing and destination, have declined significantly, with the average one-way business fare dropping by 10% between 2001 ($672) and 2004 ($607) alone.[7] While overall passenger traffic levels have begun to rebound from the combined effects of a weakened economy, the September 11, 2001 terrorist attacks, and instability overseas,[8] revenues for network carriers dropped by over 14% between 2001 and 2003.[9]

To meet competition, network carriers have aggressively moved to curb costs, reporting $19.5 billion in cost-saving initiatives between 2001 and 2003 to the Government Accountability Office (GAO). GAO found that these carriers reduced operating costs during that period by $12.7 billion -- approximately 14.5% -- through labor and salary concessions, renegotiation of

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[5] New entrant point-to-point carriers tend to fly newer equipment, with substantially lower maintenance costs and greater fuel efficiency. Their employees tend to have less experience, meaning relatively lower wage, pension and benefit expenses. Their operating models tend to be simpler, with less complicated route structures, few if any connecting passengers and service only between destinations with high passenger traffic.

[6] *Competition and Regulation in the Airline Industry,* FRBSF Economic Letter (Fed. Res. Bank of S.F.) No. 2002-01, January 18, 2002, at 2, fig. 2.

[7] U.S. Gov't Accountability Office, GAO-04-836, Legacy Airlines Must Further Reduce Costs to Restore Profitability, August 2004, at 16.

[8] Air Transp. Assoc., 2005 Economic Report at 7 (732 million Revenue Passenger Miles (RPMs) in 2004, exceeding the previous record of 693 million RPMs).

[9] GAO, August 2004, *supra* note 7, at 17.

vendor agreements and increased productivity.[10] Network carriers also reduced capacity by 12.6% over the same three years.[11] This trend has continued, with United, for example, shedding $7 billion in annual costs in the last few years, trimming its overall fleet size by nearly 200 aircraft, changing its fleet composition to younger and more efficient aircraft, and reducing its workforce by over 15,000.

Overall, however, network carriers' unit costs (the cost to fly one seat one mile) have not declined since 2000. Soaring fuel costs are the major factor. The average price of a barrel of jet fuel was 240% higher in 2005 than in 2002. This spike in energy costs resulted in an estimated $10 billion in higher costs to U.S. airlines in 2005 alone.[12] At the same time, the gap between network carriers' and point-to-point carriers' unit costs has actually widened.[13] Point-to-point carriers generally have younger, more fuel-efficient fleets, and some have sufficient liquidity to be able to hedge fuel prices. Further, many do not face the "legacy" labor costs (even after concessions) of the major carriers, such as substantial pension obligations to already retired workers.

With fares dropping, airlines have sought to increase passenger volume while cutting costs and raising utilization levels. Passenger volume, as measured by the passenger load factor (PLF), has risen from 66% in 1994 to 75% in 2004, a post-World War II high for the U.S.

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[10] *Id.* at 17. This reporting was mandated by the 2003 Emergency Wartime Supplemental Appropriations Act, which provided $7 billion in public assistance to U.S. carriers.

[11] *Id.* at 19.

[12] John Heimlich, Vice President and Chief Economist, Air Transp. Assoc., Presentation to the Institute for Economic Affairs: Energy Matters: Combating the Fuel-Related Challenges Facing U.S. Airlines (January, 2006), n.14.

[13] GAO, August 2004, *supra* note 7, at 24.

domestic market.[14] Although airlines could operate profitably during the mid to late 1990s with utilization rates of 70% or below, the Air Transport Association now estimates that the "break-even load factor" (BELF) for the industry exceeds 80%. Achieving a profitable PLF has become a nearly Sisyphean endeavor; while carriers such as United have raised load factors to record levels and the average PLF rose by 2 points in 2004, BELF rose by 1.9 points.[15]

Efforts to cut operating expenses, raise productivity, and increase utilization have not kept pace with price cuts and increases in exogenous costs, like fuel. U.S. airline losses totaled over $9 billion in 2004, nearly $8 billion of which was borne by U.S. network passenger carriers.[16] Since the end of 2000, network carriers collectively lost approximately $42 billion.[17]

None of the U.S. network carriers can overcome this profitability gap by itself. Restructuring of the industry through consolidation among major carriers is necessary to drive further cost reductions, produce greater economies of scale, and create strong, sustainable competition.

The Market Demands Consolidation, but Mergers are Denied

There is a strong consensus among industry observers that restructuring is the key to restoring a healthy network carrier industry:

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[14] Air Transp. Assoc., 2005 Economic Report, *supra* note 8, at 7.

[15] *Id.* at 13.

[16] *Id.* at 23. Southwest and JetBlue were the only profitable passenger airlines among the Air Transportation Association's members in 2004.

[17] Network carriers lost $24.3 billion between the end of 2000 and 2003. GAO, Aug. 2004, *supra* note 7, at 34. ATA estimates that industry-wide losses at $10 billion for 2005.

- "Something drastic is going to have to happen[.] Basically, you have to have [airline] consolidation." (Ray Neidl, Calyon Securities USA)[18]
- "High jet-fuel costs will force a major restructuring in the airline industry...It's merge-or-fail time." (Vaughn Cordle, Airline Forecasts LLC.)[19]
- "Because the current level of industry losses are not sustainable, some sort of shakeout must occur," (Glenn Engel, Goldman Sachs.)[20]

Despite the strong economic and financial evidence in favor of restructuring among network airlines, DOJ has largely prevented mergers among such carriers from taking place. As the Deputy Assistant Attorney General for the Antitrust Division noted in 2004, "until [the Air France/KLM merger in 2003] we had not seen a successful airline merger in some time."[21] In November of 1998, DOJ sued to enjoin Northwest from acquiring a controlling interest in Continental, forcing Northwest to divest nearly all of its 51% share in Continental. In July of 2001, DOJ announced its opposition to the proposed union of United and US Airways, after which the merger was abandoned. American Airlines was able to acquire the assets of bankrupt carrier TWA in 2001, but only obtained DOJ consent as an alternative to TWA's liquidation. In 2005, DOJ did allow the two smallest network carriers to merge, America West and US Airways,

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[18] Ted Jackovics, *Analyst Urges More Airline Consolidation*, The Tampa Tribune, Oct. 4, 2005, at 1.

[19] Scott McCartney, *The Middle Seat: Airlines Fly an Unsustainable Path --- Sky-High Price of Jet Fuel May Force Industry Revamp Or Collapse of a Big Carrier*, The Wall Street Journal, Aug. 23 2005, at D06.

[20] Scott McCartney, *The Middle Seat: Why Bad News for Airlines Is Good News For Fliers -- at Least in the Short Term*, The Wall Street Journal, Aug. 11, 2004, at D1.

[21] J. Bruce McDonald, Dep. Asst. Att'y Gen., Antitrust Div., Dept. of Justice, Remarks to the ABA Section of Antitrust Law Transportation Industry Committee: Transportation Update (Mar. 31, 2004) at 1.

but only because there was almost no overlap between those carriers' limited route systems -- a situation impossible to replicate in a merger of any of the remaining U.S. network carriers.[22]

This treatment stands in contrast to the scrutiny of mergers in other industries where DOJ and other regulators have been more open to the benefits of consolidation. In the telecommunications sector, for example, DOJ has approved nearly every merger proposed since 1996. In 2005 alone, DOJ cleared the mergers of Sprint and Nextel, SBC's acquisition of AT&T and the Verizon/Qwest acquisition of MCI. In the transportation sector, the number of large (Class I) independent freight railroad systems went from 12 to 7 as the result of mergers between 1994 and 2001, with the 5 largest now accounting for 95% of the traffic on Class I railroads. In 1996, for example, the Surface Transportation Board, over DOJ's objection, approved a merger between Southern Pacific and Union Pacific Railroads despite an analysis showing certain geographic areas, especially in Texas and Louisiana, where the transaction would result in a 2-to-1 merger.[23] Subsequent studies of the effects of the SP/UP merger have found significant merger-specific cost savings, realized efficiencies and rate reductions on most routes.[24] Mergers during the 1990s have left petroleum refining and distillation markets highly concentrated in the

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[22] R. Hewitt Pate, Asst. Att'y Gen., Antitrust Div., Dept. of Justice, Statement Regarding the Closing of the America West/US Airways Investigation, (June 23, 2005).

[23] U.S. Gen. Accounting Office, GAO-01-689, Surface Transportation Board's Oversight Could Benefit from Evidence Better Identifying How Mergers Affect Rates, (July, 2001). STB granted trackage rights to Burlington Northern-Santa Fe Railroad on many of the potential 2-1 corridors to address potential anticompetitive effects.

[24] *See, e.g., id.* at 21 (finding rail rates declined for four of six commodities reviewed, remained the same for one, and increased for another); Dennis A. Breen, *The Union Pacific/Southern Pacific Rail Merger: A Retrospective on Merger Benefits*, Rev. of Network Economics, Sept. 2004, at 317 ("[A]vailable post-merger evidence suggests significant efficiencies were achieved and passed on to shippers in the form of lower rates and enhanced service.").

Northeast U.S. and in certain Midwestern states.[25] And this past fall, DOJ approved the mergers of the NYSE/Archipelago and Nasdaq/Instinet exchanges, effectively reducing the number of major equity trading platforms from four to two.[26]

Consolidation is Necessary to Enhance Domestic and International Competition Among Networks

DOJ's apparent hostility to mergers between airlines with any significant route overlap has meant that network carriers lack one of the principal means firms in other industries have used to cut costs and become more competitive. The need for a change in DOJ's approach is evident: four of six network airlines are now, or have recently been, in bankruptcy. US Airways emerged from Chapter 11 protection (for the second time) in 2005 after merging with America West. Northwest, and Delta are currently in bankruptcy, and United has only just emerged after a restructuring process that lasted for three years.[27]

The financial challenges facing U.S. network carriers not only limit their response to aggressive competition from domestic point-to-point carriers, they also inhibit their ability to grow their own networks in direct competition with each other and to remain competitive with major foreign airlines that have been able to retain their profitability in the post September 11 world. That has allowed these foreign carriers to invest heavily in new generation aircraft such as the jumbo Airbus A380, new generation Boeing 787 and Airbus A350; improved onboard products and services; and information technology. Foreign carriers have also been able to

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[25] *See,* U.S. Gen. Accounting Office, GAO-04-96, Effects of Mergers and Market Concentration in the U.S. Petroleum Industry, (May, 2004).

[26] Department of Justice, Antitrust Division, Statement on the Closing of its Two Stock Exchange Investigations (November 16, 2005).

[27] Other legacy carriers, including ATA, Aloha and Hawaiian, have also been in bankruptcy in recent years.

expand and grow their networks through mergers and acquisitions, routine business transactions that have largely been denied to U.S. network carriers. These transactions have included Air France's merger with KLM, Lufthansa's acquisition of Swiss International, the acquisition by Jet Airways of India of its principal privately-owned competitor, Sahara Airways, and the strategic investment by Cathay Pacific in Air China.

Network carriers, whatever their nationality, have strong economic motives to build global networks. As discussed above, for such airlines expanding the number of routes served increases traffic and provides economies of scope, scale and density, driving down costs. Serving more routes feeds more traffic into the network, increasing demand across the system and permitting the operation of larger aircraft and more frequencies. Entry into new markets is easily accomplished for a hub-and-spoke carrier through the addition of more spokes to the "wheel."[28] A national network with a broad geographic distribution of hubs means entry on any particular route involves shorter distances and lower costs.

As networks grow and become national and then global in scope, adding new spokes to the wheel is an economically rational outcome, and as multiple network carriers expand, consumers gain new service options and competition is enhanced. But the current economic realities facing domestic network carriers make such expansion impossible, despite the economic benefits it could provide. Indeed, the six major network carriers have been paring routes and service, not expanding. A cash-strapped airline is simply not in a position to invest the resources necessary to expand service into new routes.

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[28] *See*, Brueckner, *supra* note 1, at 381.

But combining the remaining network carriers into a smaller number of firms would enhance the likelihood of such entry by filling in network gaps, improving the financial ability of the remaining carriers to expand, and allowing aircraft to be redeployed to serve new routes. The greater efficiencies and lower costs derived from such combinations will make the new, larger airlines more aggressive competitors. At the same time, the continued activity of low cost competition and the existence of competing service through alternate systems of hubs and spokes will prevent the accumulation or exercise of market power by the combined network carriers.

IV. DOJ's Traditional View of the Airline Industry Ignores Significant Recent Developments

DOJ's Traditional Approach Is Obsolete and Unduly Narrow

In analyzing competition issues affecting domestic network airlines, DOJ has relied on a number of preconceptions about the industry that are no longer tenable (if they ever were). First, DOJ traditionally has viewed the commercial aviation business as a tight oligopoly, with high potential for collusion, as a result of the routine communication and coordination associated with perfectly legitimate (and pro-competitive) activities like fare advertising and promotional announcements, price transparency, interlining, codesharing and scheduling.[29] Second, it has been skeptical of the likelihood of new carrier entry, especially into hub markets.[30] Finally, DOJ has made very clear that it believes that incumbent carriers in hub cities have the incentive and

[29] McDonald remarks, *supra* note 21, at pp. 2-8.

[30] Joel I. Klein, Asst. Att'y Gen., Antitrust Div., Dept. of Justice, Testimony Before the U.S. Senate Committee on Commerce, Science, and Transportation: Antitrust Issues in the Airline Industry (July 27, 2000) ("The Division does not subscribe to [competitive] entry analysis. It simply does not conform to the facts[.]").

ability to successfully engage in predation in order to deter new entry on their most profitable routes.[31]

The Department's approach to the airline industry is simply not supported by current market realities. Overall, the U.S. airline industry remains relatively unconcentrated. The aggregate Herfindahl index for the industry has stayed constant at approximately 0.1, or the equivalent of 10 equal-sized competitors.[32] Although a number of new entrant carriers such as Midway, Legend, People Express, Western Pacific and Transtar failed in the face of intense industry competition during the 1980s and 1990s, not to mention the recent failure of Independence Air, other carriers, including Southwest, Air Tran, Spirit and JetBlue, have entered the interstate market since the domestic industry was deregulated and have prospered. Indeed, during 2004, while the legacy network carriers were losing billions, these point-to-point, post-deregulation carriers were profitable. Moreover, despite the many failures, high-risk venture capital funds continue to invest in the industry, as evidenced by the startup of two new international carriers in 2005 -- Eos and MaxJet -- and the application recently filed with DOT by Virgin America to establish another major domestic competitor. Most of the point-to-point airlines flying today are generally well-capitalized and offer a product that is strongly competitive in price and service with the legacy network carriers. Southwest, for example, is the only airline that currently enjoys an investment-grade rating and has a higher market capitalization than all of the other major U.S. carriers combined.

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[31] John Nannes, Dep. Asst. Att'y Gen., Antitrust Div., Dept. of Justice, Address at the International Aviation Club: The Importance of Entry Conditions in Analyzing Airline Antitrust Issues (July 20, 1999), at 13.

[32] FRBSF Economic Letter, *supra* note 6, at 3.

Reality: Aggressive Entry by Point-to-Point Carriers

The rise of the point-to-point carriers in the past decade has transformed the commercial aviation marketplace. While the capacity of the network carriers has shrunk in recent years, point-to-point carriers and regional airlines have brought more flights on-line. Between 1998 and 2003, point-to-point carriers increased their capacity by nearly 80%.[33]

Point-to-point carriers have aggressively expanded their presence on the top 5,000 U.S. city-pair routes. Significantly, this expansion has included routes to and from the hub cities of network carriers -- markets that, according to DOJ's view, were essentially impregnable. Point-to-point carriers increased their coverage by nearly 45% between 1998 and 2003, from 1,594 to 2,304 cities served.[34] While initially confining their operations to short-haul routes, these airlines now compete on transcontinental routes as well. In 2003, for example, after serving upstate New York, Jet Blue began offering transcontinental service, followed by service to Florida and other new markets. Southwest offers flights between Baltimore, Maryland, and destinations in California. Between 2000 and 2002, point-to-point carriers grew their traffic on the New York-Los Angeles route 171% by slashing average fares 19%. These carriers now account for nearly 23% of the passenger traffic on that city-pair.[35]

Point-to-point carriers now compete for the business of nearly 85% of passengers in the top 5,000 city pairs.[36] Network carriers' share of the U.S. airline available seats has declined to 53% in 2004, from nearly 65% just four years earlier. Point-to-point carriers now command over

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[33] GAO, August 2004, *supra* note 7, at 10 fig. 3.

[34] *Id.* at 42.

[35] *Id.* at 43.

[36] *Id.* at 44.

23% of available seats, up from 15% just four years prior.[37] Southwest Airlines is now the largest domestic competitor, enplaning more passengers than any of its domestic rivals, despite having started interstate service only after the industry was deregulated in late 1978. Its planes made nearly 150,000 more flights in 2004 than the second most frequent flier, American.

Reality: A More Competitive Market

The result of new entry is that the commercial airline business is far more competitive than it has ever been. The number of routes served by three or more competitors increased by nearly 9% between 1998 and 2003.[38]

The successful entry and expansion of point-to-point carriers has transformed the commercial airline industry in the U.S. Barriers to entry at the city-pair level, if they ever existed, have largely disappeared, as point-to-point carriers have improved their products while enjoying lower costs.[39] As a result, even on routes where entry has not yet occurred or has been tried unsuccessfully in the past, the real likelihood of potential new competition disciplines incumbent carriers.[40]

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[37] Dipasis Bhadra and Pamela Texter, *Airline Networks: An Econometric Framework to Analyze Domestic U.S. Air Travel*, figure 2, (The Mitre Corp., 2004), http://www.bts.gov/publications/journal_of_transportation_and_statistics/volume_07_number_01/html/paper_06/.

[38] GAO, August 2004, *supra* note 7, at 41.

[39] As noted above, however, point-to-point carriers typically have been interested in entering only relatively populous markets expected to be profitable immediately as a result of the existing density of local demand. Although routes to smaller cities and rural areas are therefore unlikely to appeal to point-to-point carriers, there are no barriers to entry in those markets.

[40] *See, e.g.*, Brueckner, *supra* note 1 at 392-393. (Increasing the number of non-incumbent carriers serving both endpoints of a city pair lowers fare price).

Other changes have also made the market more competitive and even less conducive to any form of improper coordination. For example, the advent of greater transparency in consumer pricing, via websites such as Travelocity.com, Orbitz.com, Sidestep.com, Kayak.com and Expedia.com, allows travelers to compare prices, routes, and travel times across most airlines within minutes. Internet marketing of fares is pervasive; bookings can be made directly and quickly through carrier websites and many airlines allow consumers to sign up for low-fare "alerts" with respect to selected cities. Not surprisingly, consumers are utilizing these options in greater and greater numbers. Between 1999 and 2002 alone, reservations over the internet went from less than 10% of all bookings to roughly 30%.[41]

In addition, no doubt driven at least in part by the ease of comparing fares and itineraries made possible through the internet, as well as the point-to-point carriers' strategy of entering new markets from smaller, more suburban airports, consumers are increasingly willing to substitute among airports within a given geographic region. As a result, incumbent carriers can no longer count on maintaining their market position simply by virtue of operating a hub or holding a majority of slots at a handful of congested airports in the largest or closest-in airport in a given metropolitan area. For example, United's service at Chicago O'Hare faces fierce price competition with Southwest/ATA's and other point-to-point carriers' services at Chicago Midway, and United's hub at Washington Dulles competes directly with point-to-point carriers' service at Dulles, Southwest at Baltimore-Washington International and US Airways, Delta, and Frontier, among others, at Reagan National.

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[41] GAO, August 2004, *supra* note 7, at 8.

V. The Department's Competitive Effects Analysis Is Overly Restrictive

DOJ Disregards Network Efficiencies in Analyzing Airline Mergers

Under the Horizontal Merger Guidelines, DOJ will assess efficiency gains that the parties cannot achieve absent the merger in analyzing its competitive effects.[42] Traditionally, DOJ has been resistant to considering network efficiencies and to arguments that procompetitive benefits in one market may be weighed against potential harms in another market when assessing the overall competitive effect of a proposed transaction. Given the interrelationship between the ostensibly separate "relevant markets" served by firms in network industries like aviation, however, DOJ's approach is anachronistic and unduly restrictive. In fact, DOJ's own Merger Guidelines seem to contemplate precisely this sort of multi-market evaluation in appropriate cases, such as those involving network industries. *See* U.S. Department of Justice, Fed. Trade Comm'n, 1992 Horizontal Merger Guidelines (April 8, 1997) at §4: "In some cases, however, the Agency in its prosecutorial discretion will consider efficiencies not strictly in the relevant market, but so inextricably linked with it that a partial divesture or other remedy could not feasibly eliminate the anticompetitive effect in the relevant market without sacrificing the efficiencies in the other market(s)." Moreover, the Department's statements and practice in cases involving airlines outside the merger context make it clear that DOJ recognizes this linkage across the different routes a carrier serves. For example, DOJ has acknowledged that in analyzing proposed code share alliances between competing airlines it weighs whether "significant transaction-specific procompetitive efficiencies in serving other city pairs on a code-

[42] U.S. Dept. Of Justice, Fed. Trade Comm'n, 1992 Horizontal Merger Guidelines (April 8, 1997) at § 4.

share basis outweigh the potential competitive harm in the overlap city pair."[43] The Department should take these cross-route interrelationships and synergies into account when analyzing airline mergers as well.

This linkage between the various routes served by carriers like United is what creates the "network" -- a service that is greater and more valuable to consumers than the sum of its individual parts. The impetus for a merger between network carriers would be the *system-wide* efficiencies and benefits that would be generated. A city-pair-by-city-pair evaluation of such a transaction's costs and benefits cannot accurately capture its overall competitive effect. While any merger between two network carriers may involve some reduction of competition on a small number of individual routes currently served by both parties, such alleged "harms" must be weighed against both the likelihood of new entry and the likelihood of continued service by both carriers absent the merger, as well as the network efficiencies the transaction will create. As Justice Breyer noted almost two decades ago:

> [Antitrust policy] has long viewed with suspicion claims that a merger is justified by 'efficiency.' Greater willingness to accept these defenses may be warranted in the airline industry because of the greater likelihood that such claims will be well grounded in the facts and important to the success of deregulation.[44]

Network Efficiency Arguments Have Prevailed in Other Industries

A shift in approach to efficiency analysis for the airline industry would not break new ground; rather it would simply bring the DOJ's approach in line with its treatment of other

[43] John Nannes, Statement before Subcommittee on Aviation Committee on Commerce, Science and Transportation United States Senate: Concerning Consolidation in the Airline Industry (June 4, 1998).

[44] Stephen G. Breyer, Symposium: *Anticipating Antitrust's Centennial: Antitrust, Deregulation and the Newly Liberated Marketplace*, 75 Cal. L. Rev. 1005, 1017 (1987).

industries. Federal antitrust agencies have already applied an efficiency analysis to mergers in other network industries such as energy and telecommunications.

In telecommunications, "[t]he Antitrust Division has plainly moved beyond the ancient history of the Bell breakup and the myopic views of the 1996 telecom act to take account of the increasing competition[.]"[45] For example, Verizon and MCI, in successfully seeking approval before the FCC and DOJ of their proposed merger, argued that the transaction would result in substantial efficiency gains and cost-savings through combining their networks.[46] DOJ agreed, finding that the merger would likely enhance competition and benefit consumers through greater efficiency.[47] In 1997, the Department approved the merger of Nynex and Bell Atlantic, concluding that the likelihood of consumer benefits through merger-specific efficiencies outweighed any anticompetitive threat.[48]

In the energy industry, the Federal Trade Commission cleared Phillips Petroleum's proposed acquisition of gathering system assets from a competitor in west Texas in 1996. In its analysis, the FTC treated each gas well as a separate market (most of which had a radius of less

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[45] Arshad Mohammed, *As MCI Goes, So Goes the Arena that Bore Its Name*, The Washington Post D01 (January 7, 2006) *quoting*, R. Hewett Pate, former Asst. Att'y Gen., Antitrust Division.

[46] Public Interest Statement of Verizon and MCI Before the Federal Communications Commission, http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6517495215.

[47] Press Release, U.S. Dept. of Justice, Justice Department Requires Divestitures in Verizon's Acquisition of MCI and SBC's Acquisition of AT&T (October 27, 2005) ("[T]he Department's investigation indicated that the transactions are likely to generate substantial efficiencies that should benefit consumers.").

[48] William J. Kolasky, Dep. Asst. Att'y Gen., Antitrust Div., Remarks Before the BIICL Second Annual International and Comparative Law Conference: North Atlantic Competition Policy: Converging Toward What? (May 17, 2002).

than six square miles). The two merging systems were the only ones serving several counties west of Midland-Odessa, so this was a merger to monopoly in those counties. The parties nevertheless were able to obtain clearance from the FTC by showing that, while the harm to competition would be minor, the potential benefits would be significant. Whereas only a few producers were close enough to both existing systems to benefit from competition between them, all of the producers served by both existing systems would benefit from the substantial savings that could be realized by combining the two systems and their associated processing plants, both of which were badly under-utilized.[49]

As noted above, the refining sector overall has also become more concentrated in recent decades as a result of mergers. Nevertheless, as FTC Commissioner Kovacic recently noted: "[the U.S. has] fewer refineries than it had 20 years ago, but the average size and efficiency of refineries have increased, along with the total output of refined products."[50] In 2003 the FTC declined to challenge the Sunoco's purchase of the Coastal Eagle Refinery in Philadelphia finding that substantial "synergies" and efficiencies were likely as a result of the union.[51] Exxon-Mobil reported two years after its merger that it had achieved $4.6 billion in savings. As the Commissioners who authorized the Exxon-Mobil transaction explained: "Increasing

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[49] William J. Kolasky, Andrew R. Dick, *The Merger Guidelines and the Integration of Efficiencies into Antitrust Review of Horizontal Mergers*, 71 Antitrust L.J. 207, 231 (2003).

[50] William Kovacic, Commissioner, Federal Trade Commission, Statement Before the Committee on the Judiciary, United States Senate: Petroleum Industry Consolidation (Feb. 1, 2006), at 5.

[51] Fed. Trade Commission, Bureau of Econ., The Petroleum Industry: Mergers, Structural Change, and Antitrust Enforcement (Aug. 2004), at 35.

concentration in the oil industry may simply reflect the needs of firms competing in a global market."[52]

Finally, the federal courts have increasingly cited efficiencies in refusing to enjoin mergers.[53] For example, in *FTC v. Tenet Health Care Corp.*, the U.S. Court of Appeals for the 8th Circuit, in reversing an injunction barring the merger of two hospitals, found that the district court should have considered evidence of enhanced efficiency in evaluating the competitive effects of the transaction. The court noted that a larger hospital could increase the quality of healthcare available to consumers by attracting better doctors and offering more integrated services. In urging a deeper look at the proposed transactions, the court emphasized the importance of "properly evaluat[ing] evolving market forces" as part of a merger review, observing that a transaction "deemed anticompetitive today, could be considered procompetitive tomorrow."[54]

VI. Recommendation and Conclusion

The current approach to merger review of airlines serves no one well: neither the industry struggling with historic losses nor the flying public that has a strong stake in a robust, competitive airline industry and healthy network carriers. DOJ should take two steps to improve the process. First, it must retool its approach to airline economics and markets in light of the

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[52] Robert Pitofsky, Chairman, and Sheila F. Anthony and Mozelle W. Thompson, Commissioners, Federal Trade Commission: Statement Regarding Exxon/Mobil (Nov. 30, 1999), http://www.ftc.gov/os/1999/11/exxonmobilmaj.pdf.

[53] *See, e.g., FTC v. Tenet Health Care Corp.*, 186 F.3d 1045 (8th Cir. 1999); *FTC v. Butterworth Health Corp.*, 121 F.3d 708 (6th Cir. 1997) (unpublished opinion); *United States v. Country Lake Foods, Inc.*, 754 F.Supp. 669 (D. Minn. 1990).

[54] *Tenet Health Care*, 186 F.3d at 1055, (*quoting United States v. Mercy Health Servs.*, 107 F.3d 632, 637 (8th Cir.1997)).

new realities -- greater competition, ease of entry, and more elastic consumer demand -- in assessing the competitive effects of proposed mergers between airlines with some overlap in their route networks. Second, DOJ should not confine its analysis to an evaluation of the costs and benefits to consumers strictly on a city-pair by city-pair basis, but should also consider whether network efficiencies generated by the transaction that are necessarily "inextricably linked" to each of the product markets in which the parties compete outweigh any diminution of competition on a few individual routes. Absent a reformulation of the Department's approach along these lines, U.S. carriers will fall even further behind their global counterparts and in their ability to compete domestically. Ultimately, American consumers, communities and the U.S. economy will be the losers.

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Airline Network Benefits

IATA ECONOMICS BRIEFING Nº. 03

Measuring the additional benefits generated by airline networks for economic development.

IATA Economics Briefing N°3:
Airline Network Benefits

Mark Smyth
Brian Pearce
IATA Economics
January 2006

Contents

00 Foreword

A well-designed air transport network provides substantial social and economic benefits.

Indeed, an extensive air transport network represents one of a country's essential infrastructure assets - like a banking or telecoms network - and is a vital component for economic development and growth. Air transport provides the only worldwide passenger and cargo transportation network. It connects people and businesses to the global economy.

Yet the importance of the network is often overlooked. The wider economic benefits created by air transport - as a facilitator of growth and investment in other industries - must be recognised. Value is created not just by a new air service and the importance of the destination it serves, but by the connections this air service can also provide to a wider air transport network.

This report, for the first time, provides evidence of the value of the airline network itself. It demonstrates that air transport generates wealth not only for the aviation industry but for a wide range of businesses throughout the countries it serves. This value is set to increase even further over the next ten years.

Businesses recognise the importance of an extensive and high quality air transport network. But they also highlight their desire for further improvements in the reliability and efficiency of this network. IATA is working closely with its member airlines to respond to customers' needs. Our Simplifying the Business Campaign is an example of how greater efficiency can benefit both airlines and customers. But a high-quality air transport network also requires improvements on the infrastructure side, with substantial new investment in reliable, affordable and efficient capacity.

This study highlights the immense value of an airline network. We hope that Governments and other stakeholders will recognise its value and that our partners within the aviation industry will help us to expand and improve this network in the future.

Giovanni Bisignani
Director General & CEO, IATA

01 | Executive Summary

Policy-makers must understand that a well-designed air transport network will generate tremendous economic benefits - not just for its users, but also as a facilitator of growth and investment across the wider economy.

The air transport network is one of a country's essential infrastructure assets. It is a vital component for economic development and growth. It provides the only global transportation network for people and goods.

Air transport creates significant value for its users and for other stakeholders in the wider aviation industry - including governments. But the air transport network also generates wider economic benefits by allowing firms to be more efficient and productive and by encouraging higher investment.

Within the air transport network, each origin airport is connected to a vast number of different destinations via flights to and from 'hub' airports. Businesses - and the wider economy - benefit from the ability to access both a greater number of destinations and a higher frequency of services than would be possible through disjointed point-to-point services.

In other words, businesses benefit both from more frequent services to major destinations and from the ability to access additional economically important destinations through onward flights. All airlines that provide services between airports within the network contribute to its wider economic value.

THE OBJECTIVES OF THIS STUDY

However, the wider economic benefits of air transport are often overlooked in policy and investment appraisals. Rightly, the external environmental impacts of air transport are included in most appraisals. But if the other side of the equation - the wider economic benefits - is not considered, the appraisal is unbalanced and biased.

Many economic impact studies focus on the 'multiplier effect' of the investment in creating new jobs within the aviation industry and supply chain. But when an economy is near full employment, the net benefit for an economy of these jobs may be small, especially if they simply reflect a transfer from existing jobs in other industries or local regions. Moreover, these studies fail to measure the significant benefits created for businesses outside of the aviation industry.

This study, for the first time, provides strong evidence of the wider benefits - in terms of economic development and growth - generated by the global air transport network.

IATA commissioned Oxford Economic Forecasting (OEF) to undertake both an extensive survey of businesses and a separate statistical analysis to examine the links between the air transport network and economic growth. These results provide evidence that air transport is vital not just for the industry value chain but also for businesses throughout the world.

This evidence is based not on an airline industry view, but on the view of businesses across five countries - Chile, China, the Czech Republic, France, the US - and a wide range of industries.

KEY RESULTS

The air transport network plays a key role in supporting and facilitating economic growth. The benefits it creates accrue not just to the users of air services but also to the wider economy. Developing economies, in particular, benefit from increased access to the global air transport network, allowing their firms to reach new markets and access new sources of investment and technical knowledge.

The survey and statistical evidence demonstrates that:

1 The air transport network opens up new sales markets and boosts production efficiency and investment

- The air transport network provides vital support for a firm's sales. On average, firms report that 25% of their sales are dependent on good air transport links. The importance of air transport is especially high in the High Tech sector, where nearly 40% of sales are dependent on air services.
- Air transport plays a key role in supporting and generating sales, by providing access to larger customer markets than would otherwise be possible. Freight services provide a direct link to sales by moving goods to new markets, but passenger services are even more important in allowing management to gain a greater understanding of the different market conditions across several countries.
- The air transport network allows firms to improve their efficiency of production and to reduce costs. On average, 80% of firms report that air services are important for the efficiency of their production, with over 50% of firms saying it is vital or very important. Nearly 70% of firms report that, by allowing them to serve a bigger market, air transport allows them to exploit economies of scale substantially or to some extent, while 56% state that it also helps to reduce costs from suppliers.
- The accessibility to global markets provided by air transport provides a boost to investment decisions - both outwards by domestic firms and inwards by foreign firms. 63% of firms state it is vital or very important to investment decisions, with a further 24% saying it is somewhat important. On average, 18% of firms report that the lack of good air transport links had affected their past investment decisions, with nearly 30% of Chinese firms reporting they had changed investment decisions because of constraints on air services.

2 Businesses attach a significant value to the scope and convenience of the air transport network

- The global air transport network serves an extensive range of destinations, providing more connections between different destinations than would be possible with just direct flights. Nearly 80% of firms state that access to the major national hub airports is vital or very important, with a further 14% saying it is sometimes important.
- Businesses would, on average, require the fare to be 23% lower in order to take a non-network journey requiring a transfer between airports within the same metropolitan area rather than one that involved a connection at a hub airport.

3 The Air Transport network will become even more important to firms over the next ten years

- The air transport network will continue to play a vital role in their future operations and growth, especially in developing countries. Half of the businesses surveyed - and over 75% in China - reported that they expect to become substantially or somewhat more dependent on air transport services over the next ten years. Only 12% of firms expect their dependence on air transport to reduce.
- New technologies (e.g. video conferencing, internet) are not expected to diminish the need for air travel in an increasingly globalised economy. As many businesses think that new technologies will encourage more travel as will reduce it, while the majority think it will have no effect.

4 Greater connectivity to the Air Transport network has a significant impact on GDP growth

- A separate statistical analysis of European countries demonstrates that the level of connectivity to the air transport network can have a significant and positive impact on long-run economic performance. Connectivity increases as the range of destinations served and/or the frequency of service increases.
- For the EU countries studied, a 10% increase in the level of connectivity (proportionate to current GDP size) can increase long-run GDP by 1.1%. Using these results, the 25% increase in connectivity (relative to GDP) for the EU 10 accession countries between 2001 and 2004 could increase long-run GDP in the region by 2.75%.
- These initial results demonstrate the potential link between connectivity and long-run GDP growth. These results will be built upon through further research in the future.

SUMMARY

This report demonstrates the significant value created by the air transport network itself. This value is generated through the higher frequency and quality of service and through the ability to serve a greater number of destinations than would be possible otherwise. The value of this network will increase even further over the next ten years.

Air transport supports and facilitates economic growth but this will only occur if there is sufficient investment in infrastructure capacity to enable the airline industry to provide the connections to worldwide markets that businesses need and prosper from.

02 Introduction

The air transport network is a key infrastructure asset.

It is the only worldwide passenger and cargo transportation network, providing an essential link between individual countries and the wider global economy. Air services create significant value for passenger and freight users. The network provides access to a greater number of destinations, and more frequently, than would be possible through disjointed regional point-to-point services alone. As such, the value of the network is greater than the sum of its constituent parts.

But the existence of an extensive network also generates benefits beyond the individual user. It improves efficiency and productivity for an economy as a whole by connecting firms to a greater number of potential markets and a wider range of potential suppliers.

Yet these wider economic benefits generated by the air transport network are often missing in policy or investment appraisals. Several economic impact studies look at the 'multiplier effect' on employment within the aviation industry and its suppliers - but do not consider any wider impacts. It is extremely important that the external environmental impacts of aviation (e.g. CO_2 emissions) are properly accounted for and responsibly managed. But the other side of the equation must not be forgotten. The air transport network provides substantial benefits for an economy - beyond those accruing to users themselves - that should be recognised.

This report, for the first time, provides substantial survey-based and statistical evidence of the wider economic benefits created by the air transport network. IATA commissioned economic consultants Oxford Economic Forecasting (OEF) to undertake a survey of 625 businesses in five different countries, to analyse their use of air services and the value they place on the air network.

The countries chosen - China, Chile, the United States, the Czech Republic and France - represent different stages of economic development and different regions of the world. Separately, OEF were also commissioned to undertake a statistical analysis - focused on the 25 European Union countries - that quantifies the links between the size and connectivity of air networks and the impact this has on business investment, productivity and economic growth.

The results of this research demonstrate that air transport is vital not just for users and for those in the aviation industry value chain, but also for business investment and economic growth throughout each of the countries that the air transport network serves.

WHAT IS THE AIR TRANSPORT NETWORK?

Chapter 3 of this report describes the air transport network and how it operates. The air transport network is a global system of flight operations, connecting thousands of different destinations through both direct services and services via major hub airports. Air transport provides benefits by allowing people and goods to travel from A to B. But an air transport network provides significant additional benefits if it also allows onward travel from B to points C and D, when a direct connection between A and C or D is not economically viable.

The benefits of the air transport network as a whole increase in relation to the number of destinations served and the frequency of flights. However, the access available from an individual airport or country to the global air transport network is related not just to the number and size of the destinations served, but also the number of onward flight connections from these destinations. In other words, the overall benefit of an air service is linked to both the economic importance of the destination served and the network connections from that airport to additional destinations.

WHAT DO WE MEAN BY WIDER ECONOMIC BENEFITS?

Chapter 4 discusses the wider economic benefits generated by the air transport network. These wider economic benefits (sometimes called positive externalities) impact upon the economy as a whole, not just the direct users of air services.

Air transport generates direct economic benefits for passenger and freight users, aviation companies and their employees. It also generates indirect benefits along the supply chain through increased demand and higher employment for suppliers. Estimates of direct benefits are commonly used in policy or investment appraisals. In addition, some economic impact studies consider the indirect benefits on job creation along the aviation supply chain. However, these indirect benefits may be relatively small for the economy as a whole if they simply reflect a transfer from existing jobs in other industries or local regions.

The air transport network also generates wider economic benefits beyond the individual user and the aviation industry. A well-designed network can facilitate greater efficiency, productivity improvements and higher investment. These benefits are almost always missing from appraisals, either because they are misunderstood or because no estimate of these benefits is available. For example, a typical analysis of direct user benefits will estimate the value of a new service to the business user net of the fare that is paid (known as consumer surplus). But it doesn't capture the 'spillover' impact that a new flight or destination can have on the wider economy's export sales, production levels or investment decisions.

The wider economic benefits are both significant and sizeable. They initially accrue to firms using air transport services, but are typically passed on to customers, employees and governments - to the benefit of the economy as a whole. For example, the global air transport network can allow a firm to access new markets, organise production and supplies more efficiently, exploit economies of scale and encourage both inwards and outwards cross-border investment. The network can also have some negative economic impacts, such as congestion, though in many cases these impacts can be minimised by the provision of efficient infrastructure.

HOW CAN WE MEASURE THESE WIDER ECONOMIC BENEFITS?

Chapter 5 discusses the results of the extensive survey of firms in five different countries on the importance of the air transport network. It reflects the views of the firms themselves on the contribution of air transport connections to their export sales, efficiency and investment. The results of the survey are separated into four parts.

The first part examines the use and importance of the air transport network for the firms' existing operations and the negative impact of current constraints on air services.

The second part outlines the value to the firms of air services within the wider network rather than disjointed point-to-point services to unconnected secondary airports.

The third part looks at what improvements the firms want from the air transport network.

Lastly, the fourth part discusses the firms' expectations of the importance of an expanded and improved air transport network over the next ten years.

HOW CAN WE MEASURE THE IMPACT OF THESE BENEFITS ON THE ECONOMY AS A WHOLE?

Chapter 6 discusses the results of the separate statistical analysis on the benefits provided by the air transport network to national economies. Air transport is shown to provide both a 'quantitative' impact through the economic benefits of higher air transport usage and a 'qualitative' impact through the economic benefits provided through a greater number of destinations served and a higher frequency of service within the air transport network.

The existence of this 'qualitative' impact demonstrates that investment in new aviation infrastructure - providing greater access to the global air transport network - can help to expand an economy's productive potential.

This provides an invaluable starting point for the quantification and inclusion of wider network benefits in future policy and investment appraisals.

03 THE Air Transport Network

Air transport provides the only global transportation network for passengers and cargo, making it essential for global business operations and for personal travel and tourism. It provides substantial economic benefits by connecting people and businesses around the globe.

It also provides significant social benefits by facilitating greater communication between different parts of the world and by providing greater access to remote areas.

THE AIR TRANSPORT NETWORK CONNECTS THOUSANDS OF DESTINATIONS AROUND THE GLOBE, EITHER DIRECTLY OR VIA CONNECTIONS AT 'HUB' AIRPORTS.

It is an extremely valuable asset for an economy in its own right. National economies derive significant economic and social benefits from both their domestic air transport networks and their connections to the wider global air transport network.

For network industries, such as telecoms, the value of the network increases rapidly as the number of users increases within the network. For example, when there are two users within the network there is only one possible connection. But when the number of users increases to five, there are now ten different possible connections. Adding new users adds more value to the network by increasing the number of possible connections.

The wider benefits of the network itself arise as existing users benefit from the expansion of the same product to new users.

AIR TRANSPORT SHARES SIMILAR CHARACTERISTICS TO OTHER NETWORK INDUSTRIES.

However, the value of the air transport network increases according to the number of destinations served and the frequency of flights between them, rather than per se through a higher number of air users. Also, in contrast to the direct connectivity of the telecoms network (i.e. any user can directly call any other user in the network), the air transport network is based on a system of 'hubs' and 'spokes'.

This allows airlines to aggregate demand from the same origin to different destinations or to the same destination from different origins. But it also means that wider economic benefits from a connection to another destination are not equal. In other words, the overall benefit of an air service is linked to both the economic importance of the destination served and the network connections available from that airport to additional destinations.

THE AIR TRANSPORT NETWORK CREATES SIGNIFICANT BENEFITS.

Users benefit from a wider choice of destinations and more frequent services than would be possible through disjointed point-to-point services to secondary airports. The 'hub' and 'spoke' model allows smaller destinations to be connected via a 'hub' airport when a direct service would not be feasible.

McKinsey estimates that 20% of intra-European traffic and 40% of US domestic traffic would not be able to make the same journey if the network structure were not in place.

But the economy as a whole also benefits from the existence of the network. By providing greater and more frequent connections to global markets and suppliers, the network facilitates and boosts economic development and growth.

THE AIR TRANSPORT NETWORK CAN ALSO HAVE SOME NEGATIVE ECONOMIC IMPACTS.

For example, 'hub' airports may suffer from increased congestion and provide advantages to airlines with historic rights to airport slots. However, in many cases these impacts are best minimised by investment in new infrastructure or more efficient use of existing infrastructure rather than reductions in the network.

04 The Wider Economic Benefits OF AIR TRANSPORT

Air Transport makes a substantial contribution to global economic activity, both directly and as a facilitator of growth in other industries.

POLICY-MAKERS DO NOT RECOGNISE THE FULL VALUE OF THE AIR TRANSPORT NETWORK.

It is clear that air transport services provide benefits to users, airlines, employees and aviation partners and suppliers - as well as governments who extract taxes and charges from the industry. But policy and investment appraisals often fail to include the wider economic benefits (sometimes called positive externalities) that are also generated by the air transport network.

A typical cost-benefit analysis of an air transport proposal measures the changes in consumer surplus (e.g. the benefits to users from faster journey times, lower prices, etc) and the changes in producer surplus (e.g. the change in profits for the industry). Sometimes, studies also measure the indirect economic benefits arising from the increased demand and employment created in the aviation industry supply chain, though these are often uncertain and may only have a small net impact for the economy as a whole.

These benefits are then balanced against the direct cost of the proposal and the wider environmental and social impacts (e.g. noise, greenhouse gas emissions). However, this approach underestimates the total benefits that an air transport proposal can provide. In particular, it misses the existence of wider benefits for an economy's productive potential that help to stimulate trade, improve productivity and attract investment.

Indeed, the air transport network generates substantial wider economic benefits through its impact on the performance of other industries. These wider economic benefits directly impact upon the supply-side of an economy, increasing its production potential and efficiency.

In particular, the air transport network:

- Facilitates world trade
  Air transport connects businesses to a wide range of global markets, providing a significantly larger customer base for their products than would be accessible otherwise. It is particularly important for high-tech and knowledge-based sectors, and suppliers of time-sensitive goods.
- Boosts productivity across the global economy
  By expanding the customer base, air transport allows companies to exploit economies of scale and to reduce unit costs. By exposing domestic companies to increased foreign competition, it also helps to drive efficiency improvements among domestic firms in order to remain competitive.
- Improves the efficiency of the supply chain
  Several industries rely on air transport to operate their 'just-in-time' production operations, providing greater flexibility within the supply chain and reducing costs by minimising the need to hold stocks of supplies.
- Enables inward and outward investment
  Access to extensive air transport links allows domestic firms to identify and manage investments in foreign-based assets and encourages foreign firms to invest in the domestic country.
- Acts as a spur to innovation
  Extensive air transport links facilitate effective networking and collaboration between companies located in different parts of the globe. Access to a greater number of markets also encourages greater spending on research and development by companies, given the increased size of the potential market for future sales.

The next chapter provides survey evidence of the size and importance of these wider economic benefits to firms. There is a clear distinction between these positive externalities and the direct or indirect benefits for users and the industry.

However, the nature of these wider economic benefits means that even the survey evidence may underestimate the overall economic impacts, since individuals do not fully take into account the indirect effect that their actions can have on the wider economy. Therefore, chapter 6 provides additional insight into these benefits by examining the statistical evidence of a link between greater access to the global air transport network and the economic growth for an individual country.

05 A Survey of the Value to Firms OF THE AIR TRANSPORT NETWORK

IATA commissioned UK-based economic consultants Oxford Economic Forecasting (OEF) to undertake a survey of 625 businesses in five different countries, to analyse their use of air services and the value they place on the air network.

The countries chosen - China, Chile, the United States, the Czech Republic and France - represent different stages of economic development and different regions of the world. The businesses surveyed operate in one of four main sectors - Traditional Manufacturing, High Tech Manufacturing & Services, Financial & Business Services and Other Services.

The key results arising from the survey are as follows.

The air transport network opens up new sales markets and boosts production efficiency and investment.

- The air transport network provides vital support for a firm's sales. On average, firms report that 25% of their sales are dependent on good air transport links. The importance of air transport is especially high in the High Tech sector, where nearly 40% of sales are dependent on air services.
- Air transport plays a key role in supporting and generating sales, by providing access to larger customer markets than would otherwise be possible. Freight services provide a direct link to sales by moving goods to new markets, but passenger services are even more important in allowing management to gain a greater understanding of the different market conditions across several countries.
- The air transport network allows firms to improve their efficiency of production and to reduce costs. On average, 80% of firms report that air services are important for the efficiency of their production, with over 50% of firms saying it is vital or very important. Nearly 70% of firms report that, by allowing them to serve a bigger market, air transport allows them to exploit economies of scale substantially or to some extent, while 56% state that it also helps to reduce costs from suppliers.
- The accessibility to global markets provided by air transport provides a boost to investment decisions - both outwards by domestic firms and inwards by foreign firms. 63% of firms state it is vital or very important to investment decisions, with a further 24% saying it is somewhat important. On average, 18% of firms report that the lack of good air transport links had affected their past investment decisions, with nearly 30% of Chinese firms reporting they had changed investment decisions because of constraints on air services.

Businesses attach a significant value to the scope and convenience of the air transport network.

- The global air transport network serves an extensive range of destinations, providing more connections between different destinations than would be possible with just direct flights. Nearly 80% of firms state that access to the major national hub airports is vital or very important, with a further 14% saying it is sometimes important.
- Businesses would, on average, require the fare to be 23% lower in order to take a non-network journey requiring a transfer between airports within the same metropolitan area rather than one that involved a connection at a hub airport.

Firms want further improvements to the network, especially in reducing delays.

- Most businesses report that the air transport network meets their requirements quite well. However, businesses would also welcome further improvements to the network, particularly in terms of reliability and accessibility. Between 70 and 80% of firms stated that reducing delays in services, faster check-in and boarding times and improved road access to airports were vital or very important. Beyond this, around two-thirds of firms would also like to see further improvements to the scope of the air transport network.

The air transport network will become even more important to firms over the next ten years.

- The air transport network will continue to play a vital role in their future operations and growth, especially in developing countries. Half of the businesses surveyed - and over 75% in China - reported that they expect to become substantially or somewhat more dependent on air transport services over the next ten years. Only 12% of firms expect their dependence on air transport to reduce.
- New technologies (e.g. video conferencing, internet) are not expected to diminish the need for air travel in an increasingly globalised economy. As many businesses think that new technologies will encourage more travel as will reduce it, while the majority think it will have no effect.

The survey of businesses provides significant supporting evidence for the wider economic benefits (or positive externalities) that are generated by the air transport network. Air transport supports and facilitates economic growth. It will continue to do so for the foreseeable future, if there is sufficient investment in infrastructure and more deregulation of markets to support further expansions of the air transport network.

5.1: The Use and Importance of the Air Transport Network

AIR TRANSPORT GENERATES AND SUPPORTS OVER A QUARTER OF ALL SALES

The companies surveyed report that, on average, 25% of sales are dependent on good air transport links. The importance of air transport for sales is especially high in the High Tech sector, where nearly 40% of sales are dependent on air services (see Figure 5.1). This reflects the time-sensitive, high-value nature of products in this sector.

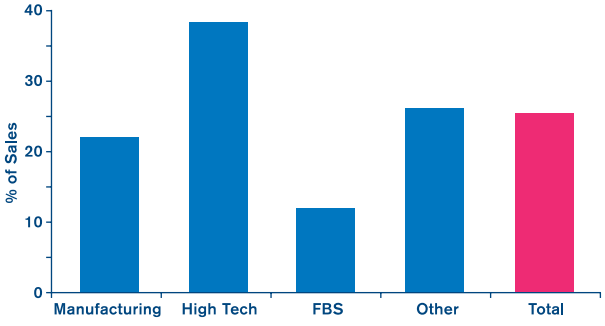
Air Transport is also more important for sales in the USA, where it supports 36% of sales (see Figure 5.2). However, the proportion of sales dependent on air services is lowest in China and the Czech Republic, reflecting the developing nature of the air transport network in these countries. It is also less than 20% in France, reflecting the strong competition from road and rail networks in Western Europe.

Over 80% of businesses report that air services are important for their sales, with nearly 60% describing it as vital or very important. The US was once again the highest with nearly 95% of firms saying that air transport is important for their sales. The importance of air transport is fairly consistent across the different types of air services, ranging from 78% of firms reporting that air freight services were important for sales to 85% who said that passenger services were important for sales (see Figure 5.3).

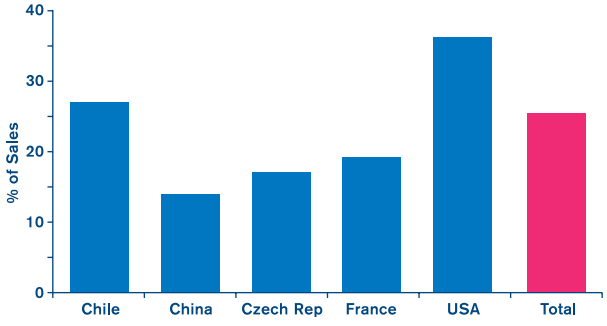
Freight services provide a direct link to sales by moving goods to new markets, but passenger services are even more important in terms of people-based services and in allowing management to gain a greater understanding of the different market conditions across several countries. Indeed, over two-thirds of firms report that passenger services are vital or very important for establishing and maintaining customer relationships.

Proportion of Sales Dependent on Good Quality Air Transport Links

5.1 By Sector



5.2 By Country



Importance of Good Quality Air Transport Services

5.3 For Sales

5.4 For Efficient Organisation of Production

AIR TRANSPORT FACILITATES SIGNIFICANT EFFICIENCY GAINS

The air transport network allows firms to improve their efficiency of production and to reduce costs in four main ways:

- Providing reliable and timely deliveries from suppliers, allowing firms to operate an efficient 'just-in-time' production process and reducing the need to hold expensive inventories;
- Allowing firms to exploit economies of scale by serving a bigger potential market;
- Allowing companies to rationalise their own production between different sites and to source raw materials and other inputs from the most cost effective suppliers;
- Facilitating the spread of new production techniques and making it easier for firms to attract higher quality employees from a broader pool of talent.

On average, 80% of firms report that air services are important for the efficiency of their production, with over 50% of firms saying it is vital or very important (see Figure 5.4). The importance is also fairly consistent across the different types of air services, with passenger services considered to be the most important. Companies in China and the US gain the most efficiency from air services, with two-thirds of companies in these countries stating that it is vital or very important for an efficient production process.

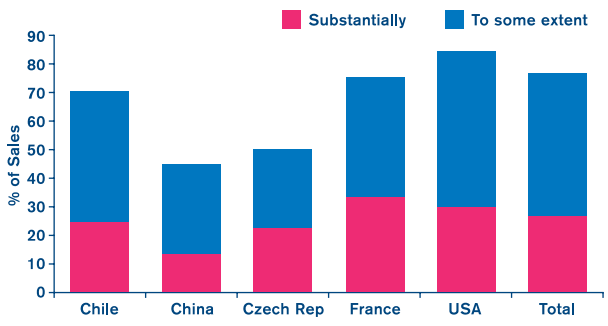
The impact of air services in exploiting economies of scale and sourcing more cost-effective suppliers is recognised by firms. Nearly 70% of firms report that, by allowing them to serve a bigger market, it allows them to exploit economies of scale substantially or to some extent (see Figure 5.5), while 56% state that it also helps to reduce costs from suppliers (see Figure 5.6).

The ability to exploit economies of scale is lowest in China and the Czech Republic, reflecting the focus of firms on the domestic market (in China's case) or exports to near neighbours (in the Czech Republic's case) at their current stage of economic development. The Czech Republic also had the lowest proportion of firms using air services to source cheaper supplies, reflecting perhaps a prevalence of nearby low-cost component producers.

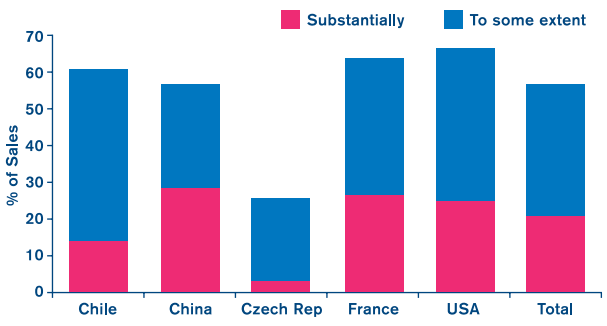
There are also significant differences between sectors in the ability to exploit economies of scale. Around three-quarters of companies in the High Tech sector report an ability to exploit these advantages, compared to only a fifth in the financial and business services sector. This reflects the greater need for individual service tailored to the client in the FBS sector, making the bigger economies of scale harder to achieve.

The trend towards globalisation of production makes good air transport links essential for the management of subsidiaries. Over 80% of firms state that passenger air services are important for their ability to manage their organisation and subsidiaries effectively. On average, nearly 30% of the employees of the companies surveyed travel on business purposes by air. As such, the companies place a high value on passenger air travel for the contact they facilitate with clients and with colleagues in overseas locations.

Implications of Serving a Bigger Potential Market
5.5 For Exploiting Economies of Scale



5.6 For Reducing Costs through New Suppliers



AIR TRANSPORT BOOSTS ECONOMIC DEVELOPMENT AND INVESTMENT

The accessibility to global markets provided by air transport provides a boost to investment decisions - both outwards by domestic firms and inwards by foreign firms. By allowing firms to serve a bigger market, air transport increases the number of potential customers for new product investment. By facilitating efficiency gains, air transport boosts the potential returns from investment in global production assets. The increased competition that arises from serving larger markets also benefits the wider economy through a more efficient allocation of resources. Competition encourages firms to specialise in the activities in which they are most efficient, while allowing other products that may be produced more efficiently elsewhere to be bought in.

The air transport network is an important factor in determining where a company makes an investment, with 63% of firms stating it is vital or very important to their investment decision and a further 24% saying it is somewhat important. Even so, air transport is one of many factors in the investment decision and is slightly less important than the cost and availability of labour, taxes and regulations and, perhaps, the local road network.

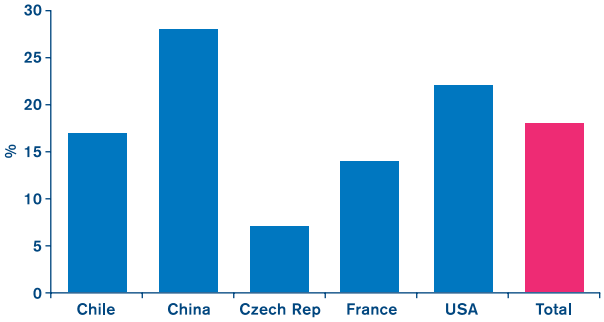
However, the absence of good air transport links can be the major determining factor in not making an investment. On average, 18% of firms reported that the lack of good air transport links had affected their past investment decisions, with the less-developed nature of the Chinese air network accounting for the higher proportion of almost 30% who had altered past investment decisions (see Figure 5.7). Of the investments that were affected, 59% were made in other locations with better air services, 18% went ahead anyway but with significantly higher costs while in 23% of cases no investment was made (see Figure 5.8).

Over half of the businesses surveyed believe that their ability to compete internationally would be very badly or moderately affected by any constraints on air transport services, with a further 27% saying they would be slightly affected. Nearly three-quarters of firms in Chile believe their competitiveness would be very badly or moderately affected, a reflection of the large distances between the country and some of its major export markets.

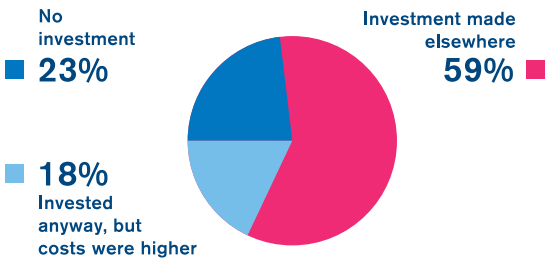
Furthermore, over 30% of companies state that they would be very badly or fairly badly affected by constraints on the availability of air transport services, while a further 40% would be inconvenienced. In particular, firms state they would be affected mostly through an increase in costs, loss of customer contact and a loss of orders. These are all factors that would restrict the productive potential of a country and its economic development. On average, 30% of firms report they would be highly likely to invest less in the region if air services were constrained, with 24% of firms highly likely to cut back on R&D investment in the region. The High Tech sector would be the most affected, reflecting the higher importance of air services to sales in the sector.

Has the Absence of Good Air Transport Links Ever Affected Investment Decisions?

5.7 Percentage Responding Yes



5.8 What Subsequently Happened



5.2: The Value of the Air Transport Network

The global air transport network serves an extensive range of destinations, providing more connections between different destinations than would be possible with just direct flights. The businesses surveyed attach a high importance to both hub and regional airports within the network.

However, they consistently view the major national hub airports (e.g. JFK, Beijing, Paris CDG) to be of greatest importance. Nearly 80% of firms stated that access to the major national hub airports is vital or very important, with a further 14% saying it is sometimes important (see Figure 5.9).

This picture was fairly consistent across the different countries. Over 50% of firms also regarded regional airports connected to the network as vital or very important. However, given its small geographical size there was a much lower need for regional airports in the Czech Republic, with Prague acting as the main airport for most of the country.

The survey also provided some insight into the use of regional airports. Nearly 60% of businesses use regional airports to take direct flights to other destinations. However, 58% of businesses also use regional airports for flights to a hub airport for onward connections to international flights. Therefore, flights connecting a regional airport to a hub airport provide benefits to businesses from both access to the hub destination and from access to onward flight connections to many other destinations.

Businesses value the greater scope of destinations provided by the air transport network, regardless of whether they are served directly or via a connection. It is the ability to access the destination that is the key factor. Indeed, no significant additional importance is given to accessing a long-haul destination through a direct flight rather than through a flight involving a connection. Of the destinations cited in the survey, most importance was attached to routes serving North America and Western Europe.

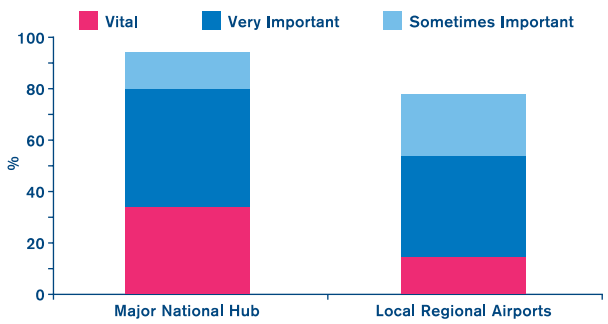
Therefore, businesses accept the need to use connecting flights in order to enjoy a greater choice of destinations. There is widespread acceptance of the need to transfer for some routes; with over 90% of firms stating that transfers between flights by the same airlines or by airlines in the same Alliance group are very acceptable or sometimes acceptable (see Figure 5.10).

However, transfer between different flights by airlines that are not part of an alliance is viewed less favourably. This relates to the increased likelihood that such connections would involve a change of terminal, or even a change of airport, adding to the inconvenience for the traveller.

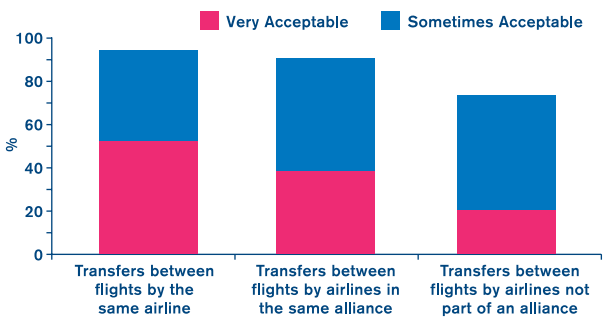
The value that businesses place on extensive and convenient connections can be measured by the costs they believe would be imposed by less convenient travel connections. Businesses were asked to consider journeys that required a transfer between airports within the same metropolitan area (e.g. a flight to JFK airport, with an onward connection from La Guardia airport) rather than one that involved a change at the same airport.

To compensate for the additional inconvenience of changing airports, businesses would, on average, require the fare to be 23% lower than for a similar journey where the connection is made at a hub airport (see Figure 5.11). Financial and business services companies require the highest reduction in the airfare (29%) to compensate for the added inconvenience, closely followed by high tech firms (28% of the airfare), reflecting the high opportunity cost of travel delays for employees in these sectors.

5.9 The Importance of Airports



5.10 The Acceptability of Flight Transfers

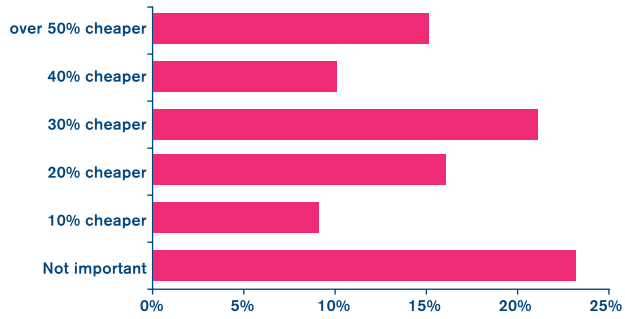


Businesses also recognise the additional benefits provided by individual airlines within the wider network, such as a frequent flyer programme. The perceived value of frequent flyer programmes emphasise the value customers perceive in having an inter-connected network of air services available.

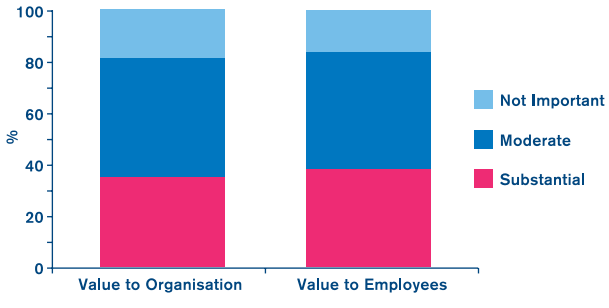
It is also a key factor behind the preference shown by businesses for transfers using the same airline or alliance group. Over 80% of firms state that frequent flyer programmes provide benefits to both the company (e.g. through fare offers from the airlines) and to the travelling employee personally, with 35 to 40% of firms believing these benefits to be substantial (see Figure 5.12).

Businesses in the US and France attach the greatest value to such programmes, with fewer organisations perceiving a substantial or moderate value in China or the Czech Republic. This may reflect how well established frequent flyer programmes in the more developed economies.

5.11 The Fare Reductions needed to compensate for transfers between airports



5.12 The Value of Frequent Flyer Programmes



5.3: The Improvements Firms Want from the Air Transport Network

In general, most businesses report that the air transport network meets their requirements quite well. Over 80% of firms report that the number of short-haul destinations served directly, the frequency of flights and the quality of both airports and airlines all meet their needs either very well or quite well (see Figure 5.13).

There is slightly less satisfaction with the number of long-haul destinations served directly and the number of destinations served with a connecting flight, but three-quarters of businesses still report that their requirements are met very well or quite well.

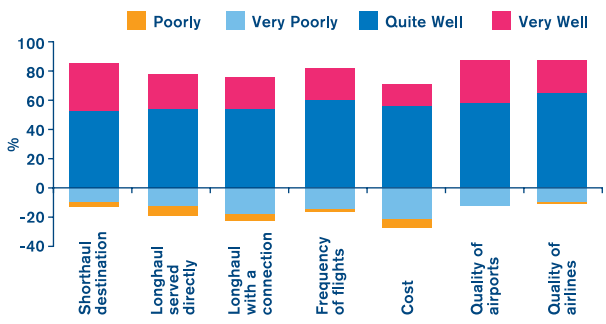
The area of least satisfaction is cost, though even here 70% of firms still feel their requirements are met very well or quite well.

Businesses were also asked where they would like to see further improvements in the air transport network. They were asked to rank the importance of ten possible improvements to air services and other more general improvements (see Figure 5.14).

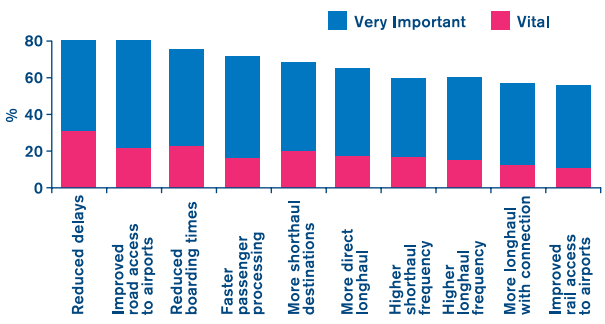
In general, it appears that the quality of service is of most concern to businesses. Reducing delays in services, faster check-in and boarding and improved road access to airports were the most important factors for businesses, with 70-80% of firms stating that improvements in these areas were vital or very important. Chinese firms expressed the greatest desire for improvements among these service quality factors.

Beyond this, improvements to the scope of the air transport network would also be helpful. Around two-thirds of firms would like to see more short-haul and long-haul destinations served directly, while 55-60% would also like to see higher frequencies and even more destinations brought within reach via a connecting flight.

5.13 How well does the air transport network serve its customers



5.14 The Improvements sought by customers to the air transport network



5.4: The Importance of the Air Transport Network over the Next Ten Years

Businesses recognise the value of the air transport network at present. But it is also important to assess whether the air transport network will continue to meet business needs over the next ten years. From the responses received from the businesses it seems that the air transport network will continue to play a vital role in their future operations and growth, especially in developing countries.

Half of the businesses surveyed reported that they expect to become substantially or somewhat more dependent on air transport services over the next ten years (see Figure 5.15).

Only 12% expect their dependence on air transport to reduce, with the remainder of firms expecting no change. Over 75% of firms in China expect to be more dependent on air transport, with the expectations of increased use also high in Chile and the Czech Republic.

The higher expected increase in these countries reflects their lower existing levels of air transport use and the above-average rates of growth in GDP and trade expected as their economies develop further.

Within the different industry sectors, high tech businesses expect to see the greatest increase in air transport use, with two-thirds of businesses expecting their dependency on air services to increase over the next ten years.

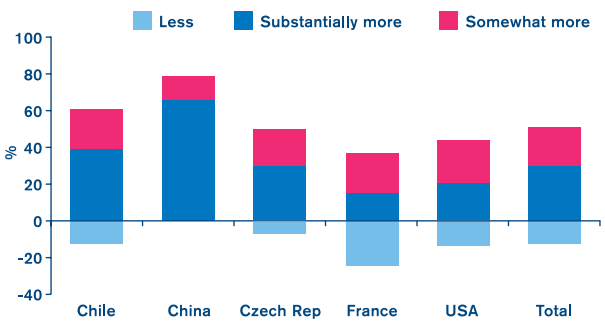
New technologies (e.g. video conferencing, Internet) are not expected to diminish the need for air travel in an increasingly globalised economy, contrary to the views of some commentators. As many businesses think that new technologies will encourage more travel as will reduce it, while the majority think it will have no effect (see Figure 5.16).

It seems that while some trips are made unnecessary by new technologies, these technologies may also foster the demand for air travel by leading to an expansion in the types of business which require face-to-face contact or products to be transported across countries. This has certainly been the pattern in recent years.

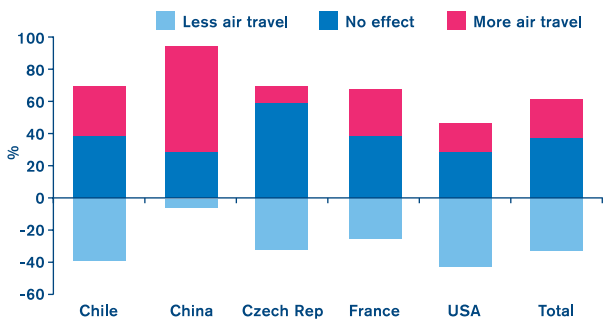
Communications technology has advanced rapidly over the last decade, with conference calls, the Internet and video conferencing, but business travel has actually increased in most sectors of the economy over this period.

How will Firms use of Air Transport Services Change over the next Ten Years?

5.15 Change in Dependence on Air Services



5.16 Impact of New Technologies on Travel



5.5: Summary of Survey Results

1. The survey of businesses provides significant supporting evidence for the wider economic benefits (or positive externalities) that are generated by the air transport network. These benefits accrue not just to the users of air services but to national economies too.

2. Air transport plays a key role in supporting and generating sales, by providing access to wider customer markets than would otherwise be possible.

3. But air transport also has a significant impact on the efficiency of production. It allows firms to exploit economies of scale, operate efficient production techniques, source cost-effective inputs and transfer and absorb knowledge from overseas.

4. The survey demonstrates the value that the air transport network itself provides, through its higher frequency and its ability to serve a greater number of destinations than would be possible otherwise.

5. The value of this network will increase even further over the next ten years, even with the widespread adoption of new communications technologies.

Air transport supports and facilitates economic growth.

It will continue to do so for the foreseeable future, if there is sufficient investment in infrastructure and more deregulation of markets to support further expansions of the air transport network.

06

A STATISTICAL ANALYSIS OF

The Value of Greater Access to the Global Network

The 'bottom-up' survey results provide strong support for the existence of wider economic benefits from the air transport network, in terms of productivity and business investment that boosts an economy's productive potential and, therefore, GDP.

This important evidence can be supplemented by a 'top-down' statistical analysis that demonstrates the wider economic benefits generated by greater access to the global air transport network (here referred to as 'connectivity').

A definition of the measure of connectivity used is outlined, at the end of the briefing, in *Appendix A*.

The survey demonstrated that business productive capacity is increased by two factors. The first is business investment, which is boosted by the wider markets that air transport allows a firm to access. The second factor is higher productivity, which is boosted by the access air transport can provide to new production techniques and more efficient suppliers. The statistical analysis looks to quantify these relationships between the air transport network and investment and productivity, which therefore provides an estimate of the long-run impact on GDP.

OEF analysed the statistical link between connectivity and long-run investment and productivity for the European Union (EU) countries. The focus was placed on the EU countries because it allowed OEF to build on the results (and database) provided by a previous study into the positive externalities of air transport[1] . The results produced are the first stage of an ongoing research programme but do demonstrate that air transport can have both a quantitative (through higher usage) and a qualitative (through an improved network) effect on GDP.

The results show that:

- The level of connectivity to the air transport network can have a significant and positive impact on long-run economic performance. Connectivity is found to have a causal link to both long-run investment and long-run productivity in an economy.
- For the European Union countries studied, a 10% increase in the level of connectivity (proportionate to current GDP size) can increase long-run GDP by 1.1%.
- For the EU 10 accession countries, connectivity to the air transport network (relative to GDP) is estimated to have increased by 25% between 2001 and 2004. Under these results, this impact alone is expected to increase GDP in the region by 2.75% over the long-run.

The connectivity measure that is used will pick-up both the quantitative and qualitative impacts of air travel. For example, as air transport usage increases in a country, so the number of air services will increase and, therefore, connections to other destinations will increase as well as the frequency with which they are served.

However, by using a connectivity measure this analysis highlights that there is a quality impact associated with the network, over and above the impact of just increasing air transport usage. It provides further support, in addition to the survey evidence of the previous chapter, on the wider economic value of the air transport network.

The full statistical results of this analysis are outlined in *Appendix B*. The results are subject to the usual caveats on data interpretation and trends associated with a cross-country statistical analysis. Indeed, an analysis of a wider range of countries would help in confirming the role of other potential variables on investment and productivity that are more difficult to pick-up with a relatively small dataset.

However, these initial results demonstrate the potential link between connectivity and GDP, and will be built upon with further research in the future.

[1]Eurocontrol: The Economic Catalytic Effects of Air Transport in Europe; July 2005.

07 Conclusions

This report provides significant new survey and statistical evidence to support the existence of wider economic benefits (or positive externalities) that are generated by the air transport network. This value is generated through the higher frequency and quality of service and through the ability to serve a greater number of destinations than would be possible otherwise. The benefits are enjoyed not only by the individual user or the aviation industry, but by the economy as a whole.

The report highlights that the air transport network is a key infrastructure asset for economic development. Air transport supports and facilitates economic growth but this will only occur if there is sufficient investment in infrastructure capacity to enable the airline industry to provide the connections to worldwide markets that businesses need and prosper from.

The key implications of the report are:

- The air transport network generates significant wider economic benefits. These benefits must be recognised in future air transport appraisals to ensure that a reasoned long-term judgement can be made.
- A well-designed air transport network impacts upon all firms in an economy. It **widens** markets, **improves** the efficiency of production and **encourages** greater investment.
- Value is created not just by a new air service and the importance of the destination but also by connections provided within the network.
- If governments consider constraining or taxing air transport for policy reasons, they must note that they could also be sacrificing the economic development benefits that the industry creates.

This report highlights the immense value of an airline network.

We hope that Governments and other stakeholders will recognise its value and that our partners within the aviation industry will help us to expand and improve this network in the future.

APPENDIX A
DEFINITION OF CONNECTIVITY

Connectivity aims to measure the quality of the air transport network from the point of view of the country's businesses. It is defined as the scope of access between an individual airport or country and the global air transport network. It is a measure of the number and economic importance of destinations served, the frequency of service to each destination and the number of onward connections available from each destination. Connectivity increases as the range of destinations and/or frequency of service increases.

IATA has used data from the OAG airline schedule database to construct a time-series indicator of the connectivity of a country's key airports to the global air transport network. The connectivity indicator measures the number of available seats to a particular destination in a certain period (taken here as the first week in November for each year from 1997 to 2004). It then weights the number of available seats by the size of the destination airport (in terms of number of passengers handled per year). This provides a proxy estimate of both the range and economic importance of the destinations, the frequency of service and the number of onward connections available.

For example, Atlanta airport, as the world's largest airport, is given a weighting of 1. Paris CDG airport, which handles 61% of the number of passengers handled by Atlanta, is given a weighting of 0.61. Therefore, if an airport has 1000 seats available to Atlanta it is given a weighted total of 1000. But if it also has 1000 seats available to Paris CDG, these are only given a weighted total of 610. The weighted totals are then summed for all destinations (and divided by a scalar factor of 1000) to determine the connectivity indicator.

The Connectivity indicator is therefore calculated as:

$$\frac{\text{Number of destinations x frequency x seats per flight weighted by the size of the destination airport}}{\text{divided by a scalar factor of 1000}}$$

A higher figure for the connectivity indicator denotes a greater degree of access to the global air transport network. Using this indicator, Table A.1 shows the importance of not just serving a large number of destinations, but serving those destinations that have a large economic importance and the ability to access a large number of onward connections. For example, in 2004 London Heathrow served only 55% more destinations than Copenhagen airport and just under four times as many destinations as Nairobi airport. But the larger number of major destinations served by Heathrow, the higher frequencies and the greater connections it provides to the global network means that its measure of connectivity is nearly four times that of Copenhagen and twenty times that of Nairobi.

Table A.1: A Measure of Connectivity to the Global Air Transport Network, 2004

	Number of Destinations Served	Number of Available Seats per Week	Connectivity Indicator
Chicago (ORD)	202	1,056,286	286.6
London Heathrow	199	944,024	244.2
Copenhagen	128	284,479	63.0
Beijing	122	551,801	92.5
Johannesburg	85	230,890	34.7
Budapest	75	101,546	24.6
Nairobi	54	78,850	12.3

APPENDIX B
STATISTICAL RESULTS

OEF undertook an econometric analysis of the relationship between connectivity and long-run investment and productivity, using data for the European Union countries between 1996 and 2004. The analysis used an Ordinary Least Squares estimation technique to find logarithmic relationships between the two dependent variables and various independent variables. A connectivity indicator was included in both equations, measuring changes in the degree of access to the air transport network as a proportion of GDP size. The results are shown in tables B.1 and B.2.

Connectivity is found to have a significant and positive impact on both investment and productivity. This impact is then translated into a long-run impact on GDP. The impact on productivity is assumed to feed directly into GDP; therefore a 10% increase in connectivity (relative to GDP) is estimated to increase both long-run productivity and GDP by 0.9%. The impact on investment is assumed to translate into GDP at a ratio 0.35, the capital stock in GDP. Therefore a 10% increase in connectivity (relative to GDP) is estimated to increase long-run investment by 0.6% and long-run GDP by 0.2%.

These impacts are then added together to produce an estimate that a 10% rise in connectivity (relative to GDP) will boost long-run GDP by 1.1%.

Table B.1: Long-Run Investment Equation

All Variables in Logs	Co-efficient	T- Statistic
Capital Stock	1	imposed
Marginal Product of Capital (GDP/K)	1.0	5.3
Connectivity / GDP	0.06	2.1
Inflation	-0.34	-5.2
Real Interest Rate	-0.33	-4.1
Stage of Development Dummy Variable (EU 10 plus Portugal and Greece)	0.08	5.9
Explanatory Power of the Model	99%	-
Durbin-Watson statistic	1.7	-

Table B.2: Long-Run Underlying Productivity (TFP) Equation

All Variables in Logs	Co-efficient	T-Statistic
R&D Spend in Manufacturing	0.024	2.8
Connectivity / GDP	0.09	3.1
Inflation	-0.19	-7.7
Stage of Development (Investment / GDP)	-0.42	-3.2
Explanatory Power of the Model	99%	-
Durbin-Watson statistic	1.7	-

A well-designed air transport network is an essential infrastructure asset and is vital for economic development and growth.
Air transport provides the only worldwide passenger and cargo transportation network.

It connects people and businesses to the global economy.

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