

June 2006

# AIRLINE DEREGULATION

Reregulating the  
Airline Industry Would  
Likely Reverse  
Consumer Benefits  
and Not Save Airline  
Pensions





Highlights of [GAO-06-630](#), a report to congressional committees

## Why GAO Did This Study

The Airline Deregulation Act of 1978 phased out the government's control over fares and service and allowed market forces to determine the price and level of domestic airline service in the United States. The intent was to increase competition and thereby lead to lower fares and improved service. In 2005, GAO reported on the tenuous finances of some airlines that have led to bankruptcy and pension terminations, in particular among those airlines that predated deregulation (referred to as legacy airlines). The House Report accompanying the 2006 Department of Transportation (DOT) Appropriation Act expressed concern about airline pension defaults and charged GAO with analyzing the impact of reregulating the airline industry on reducing potential pension defaults by airlines. GAO subsequently agreed to address the pension issue within a broad assessment of the airline industry since deregulation. Specifically, GAO is reporting on, among other things, (1) broad airline industry changes since deregulation, (2) fare and service changes since deregulation, and (3) whether there is evidence that reregulation of entry and fares would benefit consumers or the airline industry, or save airline pensions.

DOT agreed with the conclusions in this report. GAO is making no recommendations in this report.

[www.gao.gov/cgi-bin/getrpt?GAO-06-630](http://www.gao.gov/cgi-bin/getrpt?GAO-06-630).

To view the full product, including the scope and methodology, click on the link above. For more information, contact JayEtta Z. Hecker at (202) 512-2834 or [heckerj@gao.gov](mailto:heckerj@gao.gov).

## AIRLINE DEREGULATION

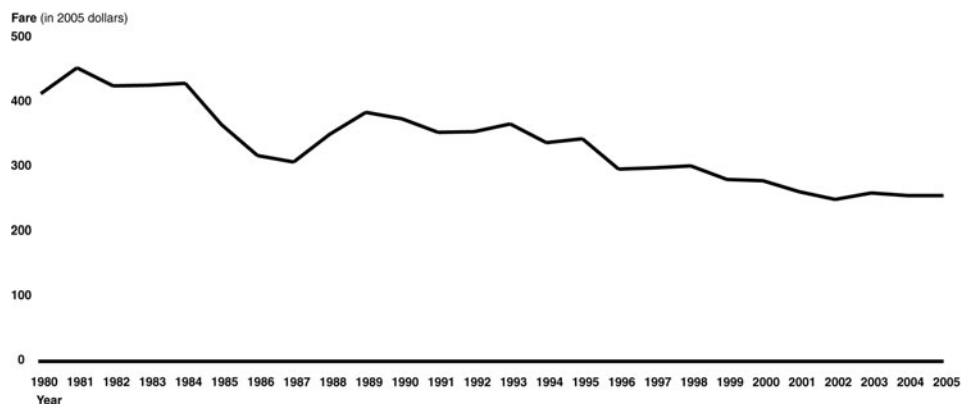
# Reregulating the Airline Industry Would Likely Reverse Consumer Benefits and Not Save Airline Pensions

## What GAO Found

The airline industry has undergone significant change since the late 1970s. Industry capacity and passenger traffic have tripled. At the same time, the industry's profitability has become more cyclical, and the financial health of large legacy airlines has become more precarious. Legacy airlines emerged from a regulated environment with relatively high structural costs, driven in part by labor costs, including defined benefit pension plan costs. Over the last few years, facing intense cost pressures from growing low-cost airlines like Southwest, both United and US Airways entered bankruptcy, voided labor contracts, and terminated their pension plans costing the Pension Benefit Guaranty Corporation, the federal government insurer of defined benefit plans, \$10 billion and beneficiaries more than \$5 billion. In 2005, two other legacy airlines entered bankruptcy leaving their pension plans in doubt. Only two airlines still have active defined benefit pension plans.

Airfares have fallen in real terms over time while service—as measured by industry connectivity and competitiveness—has improved slightly. Overall, the median fare has declined almost 40 percent since 1980 as measured in 2005 dollars (see fig. below). However, fares in shorter-distance and less-traveled markets have not fallen as much as fares in long-distance and heavily trafficked markets. Since 1980, markets have generally become more competitive; with the average number of competitors increasing from 2.2 per market in 1980 to 3.5 in 2005.

**Median Fare, 1980-2005**



The evidence suggests that reregulation of airline entry and fares would likely reverse much of the benefits that consumers have gained and would not save airline pensions. The change in fares and service since deregulation provides evidence that the vast majority of consumers have benefited, though not all to the same degree. Although a number of airlines have failed and some have terminated their pension plans, those changes resulted from the entry of more efficient competitors, poor business decisions, and inadequate pension funding rules. GAO has previously recommended that broad pension reform is needed.

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### Abbreviations

ASM	available seat miles
CAB	Civil Aeronautics Board
DOT	Department of Transportation
DPM	Domestic Passenger Mileage
EAS	Essential Air Service
EPP	Employee Protection Program
FAA	Federal Aviation Administration
FTE	full-time equivalent
PBGC	Pension Benefit Guaranty Corporation
RPM	revenue passenger miles
SIFL	Standard Industry Fare Level

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United States Government Accountability Office  
Washington, DC 20548

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June 9, 2006

The Honorable Jerry Lewis  
Chairman  
The Honorable David R. Obey  
Ranking Minority Member  
Committee on Appropriations  
United States House of Representatives

The Honorable Thad Cochran  
Chairman  
The Honorable Robert C. Byrd  
Ranking Minority Member  
Committee on Appropriations  
United States Senate

In 1978, Congress deregulated the airline industry. The Airline Deregulation Act of 1978 phased out the government's control over fares and service and allowed market forces to determine the price and level of domestic airline service in the United States. We have previously reported that overall fares have declined and service has increased since deregulation, but that these benefits have not been evenly distributed throughout all markets. More recently, we reported on the tenuous finances of some airlines that have led to bankruptcy and pension terminations,<sup>1</sup> in particular among those airlines whose operations predated deregulation, referred to as legacy airlines. Critics of deregulation, including some academics and some in Congress, have pointed to industry instability that has resulted in industry layoffs and pension terminations along with declining service and high fares for some communities as evidence of negative effects of deregulation.

The House report accompanying the 2006 Department of Transportation (DOT) appropriations legislation expressed concern about airline pension defaults and charged us with analyzing the impact of reregulating the

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<sup>1</sup>GAO, *Commercial Aviation: Bankruptcy and Pension Problems Are Symptoms of Underlying Structural Issues*, [GAO-05-945](#) (Washington, D.C.: Sept. 30, 2005).

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airline industry on reducing potential pension defaults by airlines.<sup>2</sup> In subsequent discussion with House appropriations offices, following our in-depth report on airline pensions and bankruptcy, we agreed to more broadly assess the airline industry since deregulation. Specifically, we agreed to report on (1) the original rationale for deregulating the airline industry in 1978, (2) broad airline industry changes since deregulation, (3) fare and service changes since deregulation, and (4) whether there is evidence that reregulation of airline entry and rates would benefit consumers and the airline industry, or save airline pensions.

To address these objectives, we relied on historical documents, our past studies, and our analysis of DOT passenger ticket data. To assess the original intent of Congress in passing the Airline Deregulation Act, we reviewed the act and accompanying legislative materials and various other documents and studies. To evaluate past changes in the airline industry, we reviewed our past studies, reviewed DOT studies, analyzed financial and operational data, and interviewed industry experts. To analyze fare and service changes since deregulation, we used the DOT's Origin and Destination Survey, a database containing information on every tenth airline ticket sold. The survey includes the fare paid (including taxes) and itinerary, including flight segments. The survey does not provide information on frequency, type of aircraft, or operational performance. We excluded tickets with international, Hawaiian, or Alaskan destinations or origins so that we could examine changes within continental U.S. domestic markets. To simplify the analysis, we examined only tickets for flights during the second quarter of each year—generally considered neither the busiest nor the slowest quarter of the year. We limited our analysis of service measures to only those city-pairs with at least thirteen passengers in our sample (or about 130 actual flying passengers) in every quarter in order to ensure that the changes in service we observed in our sample reflected actual flow routes and were not due to sampling or data error. Even so, the vast majority of passengers were included in our analysis—for example, in 2005, excluding city-pair markets with less than 13 passengers per quarter excluded only one percent of passengers. In addition, for our analysis of competition in city pairs, to ensure the sampling confidence in each competitor airline, we limited our analysis to city pairs with at least 118 passengers in the sample (or about 1180 actual

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<sup>2</sup>House Report 109-153 accompanying P.L. 109-115, Departments of Transportation, Treasury, and Housing and Urban Development, The Judiciary, District of Columbia, and Independent Agencies Appropriations Act, 2006.

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flying passengers) per quarter. No minimum passenger levels were imposed for our analysis of fares. Because the survey does not identify the destination airport, to ensure city-pair accuracy, we eliminated nonsymmetrical roundtrip tickets. We reviewed our methods and results with DOT and academic experts from the Massachusetts Institute of Technology's Global Airline Industry Program. To determine whether there is sufficient evidence to reregulate the airline industry, we considered our findings under the prior questions of this report, especially the changes in fares and service since deregulation. We also considered the findings of our earlier reports, especially those relating to small community air service and defined benefit pension terminations and regulation. We performed our work between September 2005 and May 2006 in accordance with generally accepted government auditing standards.

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## Results in Brief

Airline deregulation was premised on an expectation that an unregulated industry would attract new airlines and increase competition, thereby benefiting consumers with lower fares and improved service. The intent of Congress was to allow new and existing airlines to enter and serve any market they wanted (and provide service at whatever price they wanted) in order to boost competition, thereby lowering fares and expanding service. The framers of the act recognized that this approach could cause some airlines to fail and could lead to some communities losing some levels of service. As a result, the act created the Essential Air Service (EAS) program which subsidizes air service to small communities. The act also established the Employee Protection Program (EPP), which was ultimately repealed and never provided any assistance, but was intended to provide displaced airline employees with compensation and the right to be rehired by airlines before any other potential applicants. Even with deregulation, the federal government continues to play a role in air commerce in a variety of other ways—from the Federal Aviation Administration (FAA), which oversees air navigation, safety, and airport investment; to the Department of Homeland Security, which oversees passenger security; to DOT, which oversees international agreements and has a mandate to protect consumers from unfair and deceptive practices in air transportation and its sale.

The airline industry has undergone significant change since the late 1970s. Passenger traffic and, with it, industry revenues, have expanded. However, expenses have grown just as fast and profits have become increasingly cyclical. Airlines that predated deregulation, called legacy airlines, emerged from regulation with significant structural costs, including labor

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contracts that funded defined benefit pension plans. Legacy airlines dominated the industry during the 1980s and 1990s because of their size and a variety of business practices that made it difficult for new entrant airlines to compete. Industry employment, compensation, and efficiency have all grown since deregulation. However, with the major industry downturn that began in 2000, new entrant airlines—unburdened by many of the structural costs of legacy airlines—were better able to compete for passengers with low fares and have gained market share. By 2003, we found that low-cost airlines served 2,304 out of the top 5,000 city-pair domestic markets, representing a presence in markets available to almost 85 percent of all passengers. In response to sizeable financial losses after 2000, both United and US Airways entered bankruptcy and terminated their pension plans, costing the Pension Benefit Guaranty Corporation (PBGC) nearly \$10 billion and beneficiaries more than \$5 billion. In 2005, two other legacy airlines entered bankruptcy, leaving their pension plans in doubt. Only two airlines, American and Continental, still have active defined benefit pension plans in place.

As predicted by the framers of deregulation, airline markets have become more competitive and fares have fallen since deregulation. For consumers, airfares have fallen in real terms since 1980 while service has generally improved. Overall, median fares have declined in real terms by nearly 40 percent since 1980. However, fares in shorter-distance and less-traveled city-pair markets (e.g., those between smaller cities) have not fallen as much as fares in longer-distance and heavily-trafficked markets. While the competition brought about by deregulation likely played a significant role in bringing down fares, the extent to which these changes are directly attributable to deregulation as opposed to other factors, such as advances in technology or economic factors, is difficult to isolate. Various studies have attributed substantial consumer benefits to deregulation, but estimating the size of this benefit requires making several assumptions about what fares would be if they were still regulated. Furthermore, our analysis of airline service indicates that more passengers are flying between more city-pair markets, but that, on average, passengers are making more connections to reach their destinations. Service improvements have not been as evident in smaller markets as in larger ones. Since 1980, city-pair markets have generally become more competitive even while passenger traffic became more concentrated. Longer-distance and more heavily traveled markets in particular have become more competitive, with the average number of competitors growing from 2.2 per market in 1980 to 3.5 in 2005. Some DOT indicators of other aspects of service quality, such as rates of on-time arrival or lost luggage, suggest that service quality may have eroded somewhat over the



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past few years; however, we did not evaluate these measures or other indicators of service quality, such as flight frequency, type of aircraft used, or in-flight amenities.

The evidence suggests that reregulation of airline entry and fares would likely reverse much of the benefits that consumers have gained and would not save airline pensions. Our analysis of fares and service since deregulation provides evidence that consumers have benefited from lower fares since the airlines were deregulated. Since deregulation, competition has generally increased, traffic has expanded, and fares have declined. The primary dislocations that have occurred since deregulation—loss of service to some communities and the decline of legacy airlines’ finances and pensions—are the result of competitive market forces. Therefore, attempting to resolve the dislocations that have occurred for some small communities or the loss of pension benefits for some airline workers by restraining these same forces could reverse some of the gains that have accrued. If Congress determines that service to small communities is inadequate, then direct subsidies—such as the Essential Air Service program provides—might be a more efficient solution than reregulating the industry and diminishing the benefits gained by a majority of consumers. The financial distress of some legacy airlines, while regrettable (especially for airline employees), was not unanticipated, and is evidence of a functioning market in which lower-cost airlines have emerged, generally benefiting consumers with lower fares. These financial problems also caused several legacy airlines to freeze or terminate their defined benefit pension plans, leaving only two airlines with active plans. The airlines’ pension problems are no different from the pension problems occurring throughout the economy and, as we previously reported,<sup>3</sup> can be traced to broad economic factors, poor management decisions, and inadequate pension regulation. Therefore, broad pension reform that is comprehensive in scope and balanced in effect, such as we previously recommended, would more logically address problems with airline pensions than more sweeping airline industry regulation, which could undo the benefits that deregulation has achieved. DOT generally agreed with this report’s facts and conclusions, but did not provide written comments. DOT provided technical comments and suggestions that we incorporated as appropriate.

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<sup>3</sup>[GAO-05-945](#).

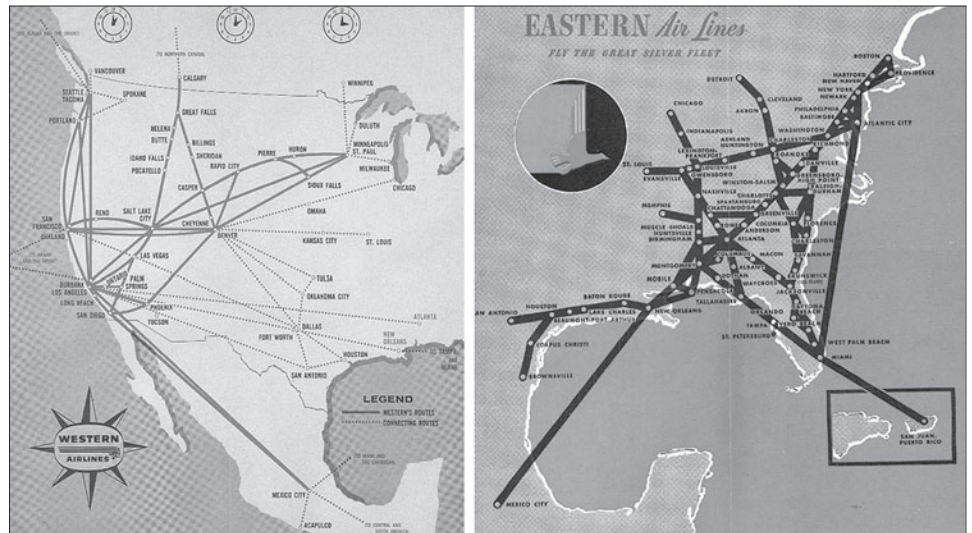
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## Background

Industrywide regulation of the U.S. airline industry began in 1938 in response to congressional concern over safety, airlines' financial health, and perceived inequities between airlines and other regulated forms of transportation. The Civil Aeronautics Act of 1938 (P.L. 706) applied to interstate operations of U.S. airlines and gave the Civil Aeronautics Authority, redesignated as the Civil Aeronautics Board (CAB) in 1940, authority to regulate which airlines operated on each route and what fares they could charge. Airlines could not add or abandon routes or change fares without CAB approval.

CAB also limited the number of airlines in the industry. In 1938, the interstate U.S. airline industry consisted of 16 "trunk" airlines, but this number contracted to 10 by 1974, despite 79 applications from new airlines to initiate service. Competition was limited on a route to one airline unless the CAB determined that demand was sufficient to support an additional airline. Airfares were based on a complex cost-based formula used by the CAB, though the exact formulas and process varied over the life of the CAB. Generally, though, airlines during this time had little incentive to reduce costs, since each was assured a fixed rate of return. As a result, the competition that existed among airlines was largely based on the quality of service. Airlines operated largely a point-to-point system, more similar to railroads than the airline networks that we know today. For example, as shown in figure 1, the route-maps of Eastern Airlines (1948) and Western Airlines (1962) show a system vastly different from today's hub-and-spoke networks.

**Figure 1: Western Airlines (1962) and Eastern Airlines (1948) Route Map**



Source: Western Airlines and Eastern Airlines.

Airlines have traditionally relied on union labor, and labor relations have been covered by the Railway Labor Act since 1936. The union bargaining structure that developed within the airline industry has been highly decentralized and separated by craft (e.g., pilots, mechanics, etc.). Before deregulation, unions and airline management engaged in carrier-by-carrier bargaining whereby the last contract signed by one carrier generally served as the starting point for the next airline (known as “pattern bargaining”). During regulation, labor relations were generally good because CAB’s fare-setting allowed airlines to pass increased labor costs on to passengers. Airlines’ bargaining power was enhanced by the Mutual Aid Pact, a strike insurance plan created in 1958, through which a struck airline was compensated by nonstruck airlines based on increases in traffic the latter received during a strike. The Mutual Aid Pact was eliminated with deregulation, thereby enhancing airline labor’s power in contract negotiations.

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## Airline Deregulation Was Originally Intended to Encourage Competition, Thereby Lowering Fares and Improving Service

The Airline Deregulation Act phased out federal control over airline pricing and routes. Airline deregulation was premised on an expectation that an unregulated industry would attract entry and increase competition among airlines, thereby benefiting consumers with lower fares and improved service. The experience of unregulated (i.e., state-regulated) intrastate service in Texas and California provided support for this expectation. Moreover, prior to deregulation, industry analysts—on the basis of conventional economic reasoning—expected that opportunities for increased competition would increase the number of airlines operating in many markets, thereby lowering fares and expanding service.

The Airline Deregulation Act established specific goals of encouraging competition by attracting new entrant airlines and allowing existing airlines to expand. According to the act, competition was expected to lower fares and expand service, the chief aims of deregulation.<sup>4</sup> At the same time, Congress recognized that deregulation could lead to economic dislocations for some communities and workers as service patterns adjusted and airlines entered and exited markets and the industry overall. As a result, the EAS program and the EPP were established.

- The EAS program was put into place to guarantee that small communities served by commercial airlines before deregulation would maintain a minimal level of scheduled air service. DOT currently subsidizes commuter airlines to serve approximately 150 rural communities across the country that otherwise would not receive any scheduled air service. According to DOT, EAS subsidizes 39 communities in Alaska and 115 more in the rest of the United States. The EAS budget ranged from about \$100 million early in the program down to about \$25 million, before rising in recent years to \$100 million. In Fiscal Year 2006, EAS was funded at \$109 million.
- EPP was created, first, to compensate airline workers who lost their jobs or received lower pay as a result of bankruptcies or major contractions whose major cause was airline deregulation and, second, to grant such workers first-hire rights. However, the Department of Labor delayed the

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<sup>4</sup>Along with the airline industry, Congress deregulated rail, trucking, and telecommunications. Overseas, similar efforts to deregulate major industries have taken place in the world's major market economies. Generally, the intent in each case has been similar—to induce competition and thereby lower fares. In only a few cases, and in fairly narrow circumstances, has a deregulated industry been reregulated. For example, following cable television's deregulation, Congress established rate ceilings in cities that lacked sufficient competition.

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establishment of regulations to administer these rights, Congress did not appropriate funds to compensate displaced employees, and airlines fought the requirements in court. On August 7, 1998, the statute authorizing the EPP was repealed.<sup>5</sup> No compensation was ever provided to displaced employees, and the first-hire right was never enforced.

While the practice of setting of airline entry and rates was deregulated, the federal government is still involved in many facets of the airline industry, including many aspects that affect the economics of the industry. For example, the federal government still influences financing and investment decisions affecting the nation's aviation infrastructure, including airports and air navigation systems. In addition to the various taxes and user fees on commercial airline tickets, which averaged 15.5 percent of the base fare in 2002, the federal government also provides support from its general fund for FAA operations.<sup>6</sup> In 2007, the Airport and Airways Trust Fund, which finances the nation's aviation infrastructure, will be up for renewal. The federal government also provided commercial airlines with \$7.4 billion in financial assistance and \$1.6 billion in loan guarantees for six airlines as a result of the September 11, 2001, terrorist attacks. Finally, PBGC has assumed almost \$12 billion in net airline pension obligations since 1991.<sup>7</sup>

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## The Airline Industry Has Undergone Significant Change since Deregulation

The airline industry has undergone significant change since the late 1970s. Air travel, and along with it industry revenues and expenses, have tripled since 1978. However, industry profits have become increasingly cyclic, with the most recent downturn leading to almost \$28 billion in operating losses since 2001. Airline employee compensation grew following deregulation, even though many studies have found that employees earned a premium under regulation. Nevertheless, employee compensation as a share of total expenses has declined, especially in recent years. During

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<sup>5</sup>Section 199(a)(6) of the Workforce Investment Act of 1998, P.L. 105-220, 112 Stat. 1059.

<sup>6</sup>GAO, *Summary Analysis of Federal Commercial Aviation Taxes and Fees*, [GAO-04-406R](#) (Washington, D.C.: March 12, 2004).

<sup>7</sup>PBGC was established to encourage the continuation and maintenance of voluntary private pension plans and to insure the benefits of workers and retirees in defined benefit plans should plan sponsors fail to pay benefits. However, if a pension plan's assets are insufficient to pay accrued benefits, the plan can be terminated under certain conditions, and PBGC then assumes responsibility for paying retiree pensions. Airlines have used provisions of chapter 11 of the bankruptcy code to terminate labor contracts, including their defined benefit pension plans.

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regulation, airlines operated almost as regulated monopolies, encountering little competition and facing little pressure to restrain costs because fares were based on the airlines' costs plus a fixed rate of return. Following deregulation, legacy airlines were able to stave off new entrant competition through various operating barriers, such as FAA-imposed take-off and landing times at congested airports (slot controls), perimeter rules at Washington Reagan National Airport, and airlines' exclusive-use control of gate leases; and business practices, such as frequent flyer programs and ticket distribution systems. The market downturn that began in 2000 exposed legacy airlines' precarious financial condition, allowing low-cost airlines the opportunity to compete more aggressively. Owing to financial instability since deregulation, airlines operating in bankruptcy have become more common, but we found that bankruptcy protection has not adversely affected nonbankrupt airlines. More troubling has been the use of bankruptcy to terminate defined-benefit pension plans, costing the PBGC and airline employees billions of dollars. Only two airlines still offer defined benefit pension plans.

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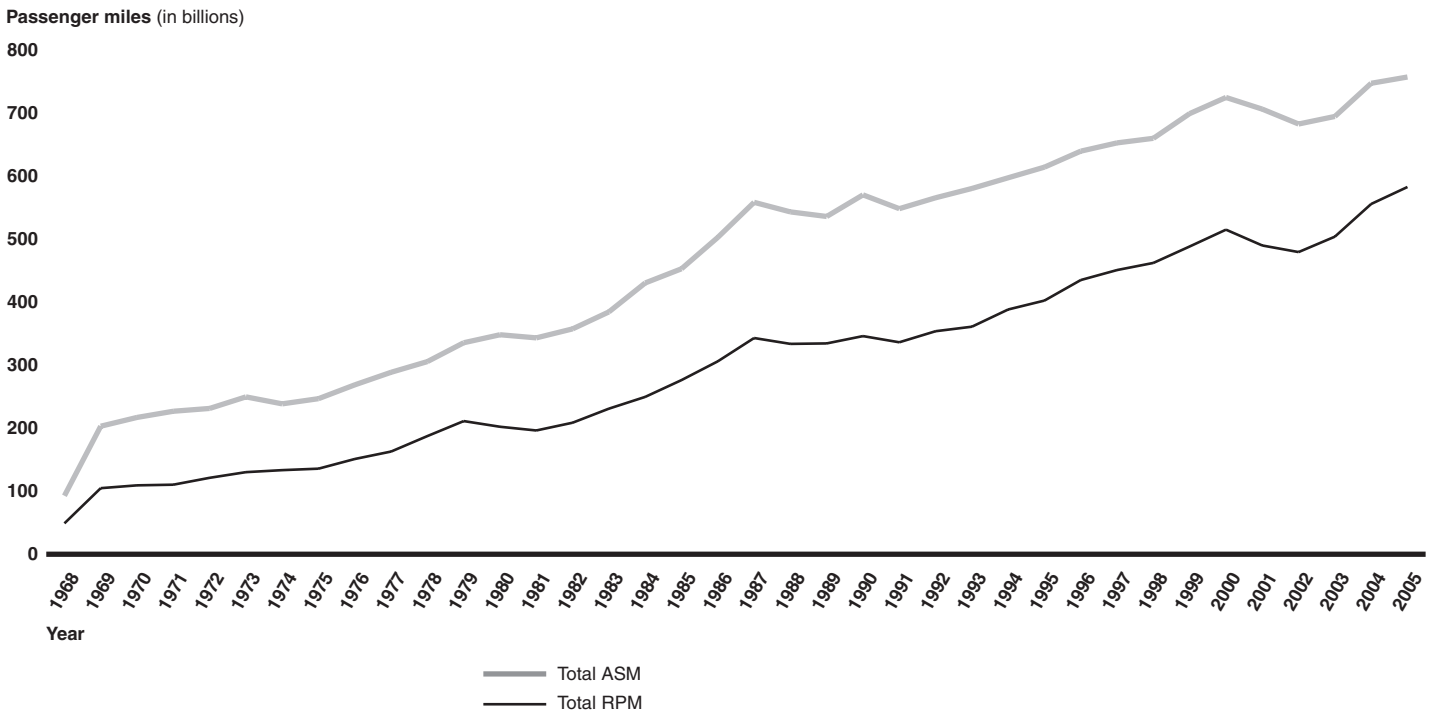
## The U.S. Airline Industry Has Expanded since Deregulation

The U.S. airline industry has expanded threefold since deregulation. Figure 2 shows that the consumption of airline travel as measured by revenue passenger miles (RPM) grew from 188 billion RPMs in 1978 to 584 billion RPMs in 2005, while airline capacity grew at a similar pace—from 306 billion available seat miles (ASM) in 1978 to 758 billion ASMs in 2005. Over the same period, revenue passenger enplanements<sup>8</sup> increased from 254 million in 1978 to 670 million in 2005.

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<sup>8</sup>“Enplanement” is defined as one fare-paying passenger—originating or connecting—boarding an aircraft with a unique flight coupon.

**Figure 2: Air Travel Capacity and Consumption, ASM and RPM growth 1968–2005**



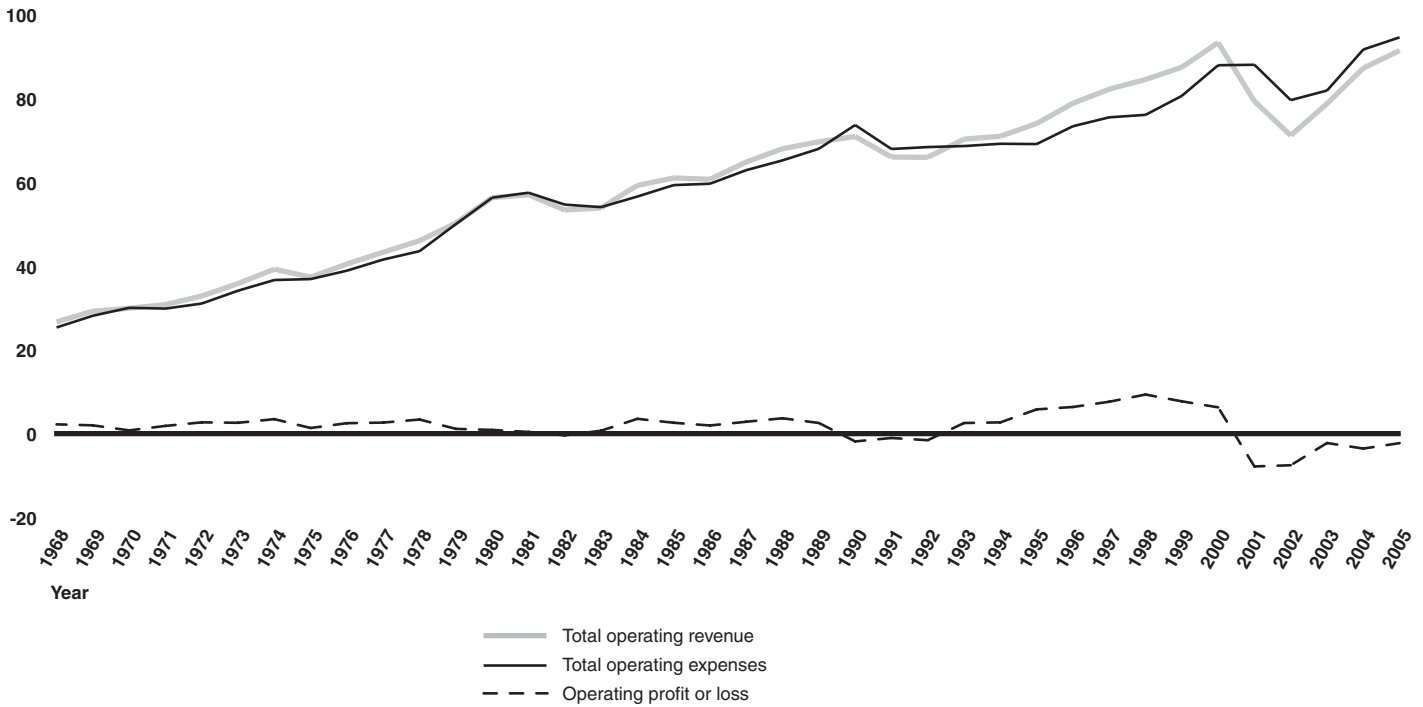
Source: GAO analysis of DOT Form 41 data.  
 Note: U.S. domestic airlines, excluding cargo.

Owing to the growth of air travel, U.S. airlines’ revenues grew almost fourfold in real terms (see fig. 3). However, expenses also grew at a similar pace, sometimes outpacing industry revenues. While profits were relatively stable under regulation, earnings have been increasingly cyclical since deregulation. One explanation for this cyclicity is that, with revenues closely tied to the business cycle, high fixed costs for aircraft, and a rigid and costly labor structure, outside shocks—such as the September 11, 2001, attacks or high fuel prices—make it difficult for the industry to adjust its capacity. The industry has incurred operating losses of nearly \$28 billion since 2001, most of this by legacy airlines.<sup>9</sup> These airlines have compensated by taking on additional debt, using all (or nearly all) of their assets as collateral and limiting future access to capital.

<sup>9</sup>Legacy airlines are generally considered to be those that predated deregulation, while low-cost airlines generally entered interstate service following deregulation.

**Figure 3: U.S. Airline Operating Revenue, Expenses, and Profits, 1968–2005**

Dollars (in billions, 2005 dollars)



— Total operating revenue  
 — Total operating expenses  
 - - - Operating profit or loss

Source: GAO analysis of DOT Form 41 data.

Note: U.S. domestic airlines, excluding cargo.

### Airline Salaries, Compensation, and Efficiency Have Grown since Deregulation

There have been significant changes to airline employee compensation, employment, and productivity since deregulation. Prior to deregulation, labor was highly unionized and wage demands were typically met. Regulation allowed for increases in labor costs to be passed on to consumers through the regulated fare system. Several studies have estimated that airline wages were greater under regulation than they



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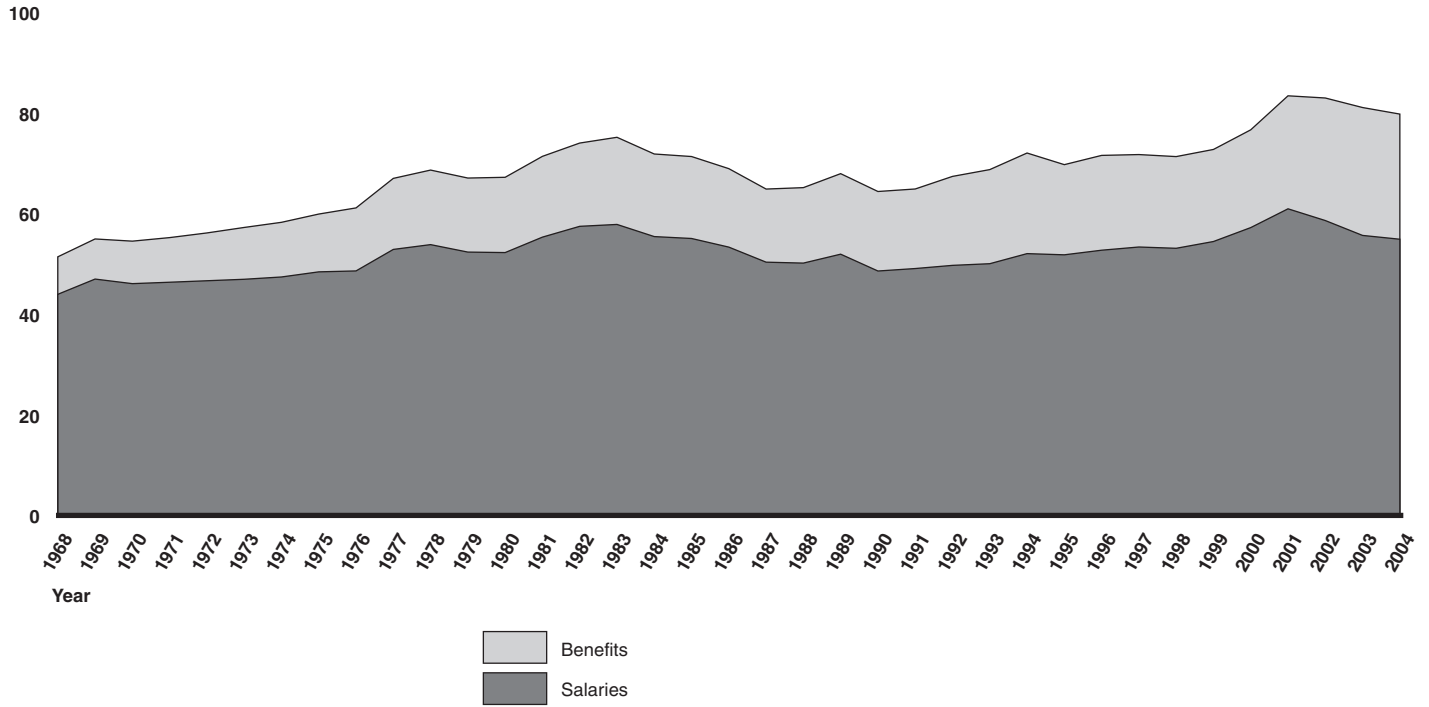
would have been in a competitive deregulated market.<sup>10</sup> Even so, industry growth, barriers to entry, and union bargaining strength allowed labor to protect its compensation following deregulation. Since 1978, airline industry salaries and total compensation experienced real increases, though with some decline since 2002 (see fig. 4). Inflation-adjusted benefits per employee grew on average from \$14,703 in 1979 to \$24,852 in 2004, a real increase of almost 70 percent. Meanwhile, inflation-adjusted salaries per employee grew from \$52,295 in 1979 to \$54,848 in 2004 on average, a real increase of less than 5 percent. Despite this increase in compensation costs, employee compensation as a share of total operating costs has declined since deregulation, especially since 2002 (see fig. 5). This decline in compensation costs as a share of total operating expense is attributable to falling employment levels, to large increases in capacity, and increases in other costs (especially for fuel). Employment began to decline with the industry downturn that began in 2000. As a result, measures of overall industry efficiency (as illustrated by available seat miles per employee in fig. 6) increased significantly. This is attributable to efficiency gains by legacy airlines during and under the threat of bankruptcy, and to more efficient low-cost carriers providing more capacity than previously.

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<sup>10</sup>For example, David Card estimated that relative wages in the airline industry fell 10 percent following deregulation. See “Deregulation and Labor Earnings in the Airline Industry” *NBER Working Paper 5687*, July 1996. Pierre-Yves Crémieux estimated that flight attendants’ earnings were at least 12 percent lower by 1985 and 39 percent lower by 1992 than if deregulation had not occurred, and that the corresponding shortfalls for pilots were 12 percent and 22 percent. See “The Effect of Deregulation on Employee Earnings: Pilots, Flight Attendants, and Mechanics, 1959-1992” *Industrial and Labor Relations Review*, Vol. 49, No. 2 (January 1996). Hirsch and Macpherson also estimated that airline wages decreased markedly during the later 1980s and early 1990s, despite continued union bargaining power. See “Earnings, Rents, and Competition in the Airline Labor Market” *Journal of Labor Economics*, Vol. 18, No. 1, January 2000, pp. 125-55.

**Figure 4: Airline Salaries and Benefits per Employee, 1968–2004**

Dollars (in thousands, 2005 dollars)

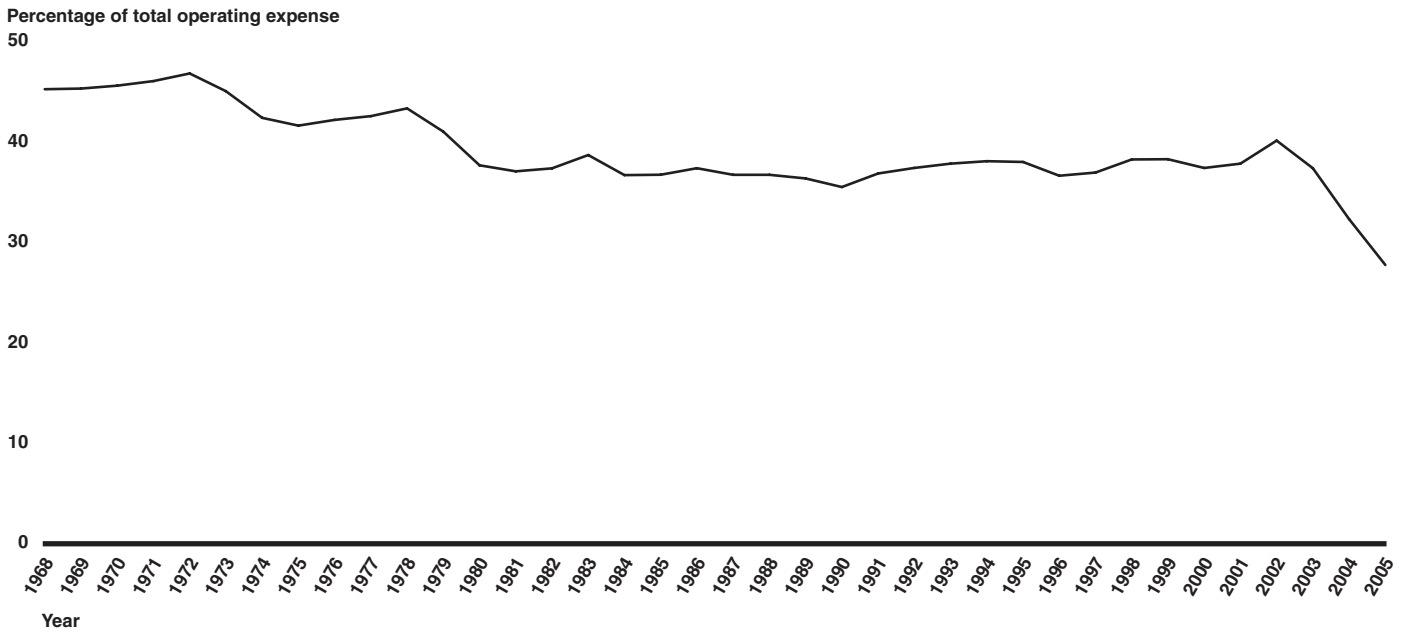


Benefits  
Salaries

Source: GAO analysis of DOT Form 41 data.

Note: U.S. Domestic airlines, excluding cargo.

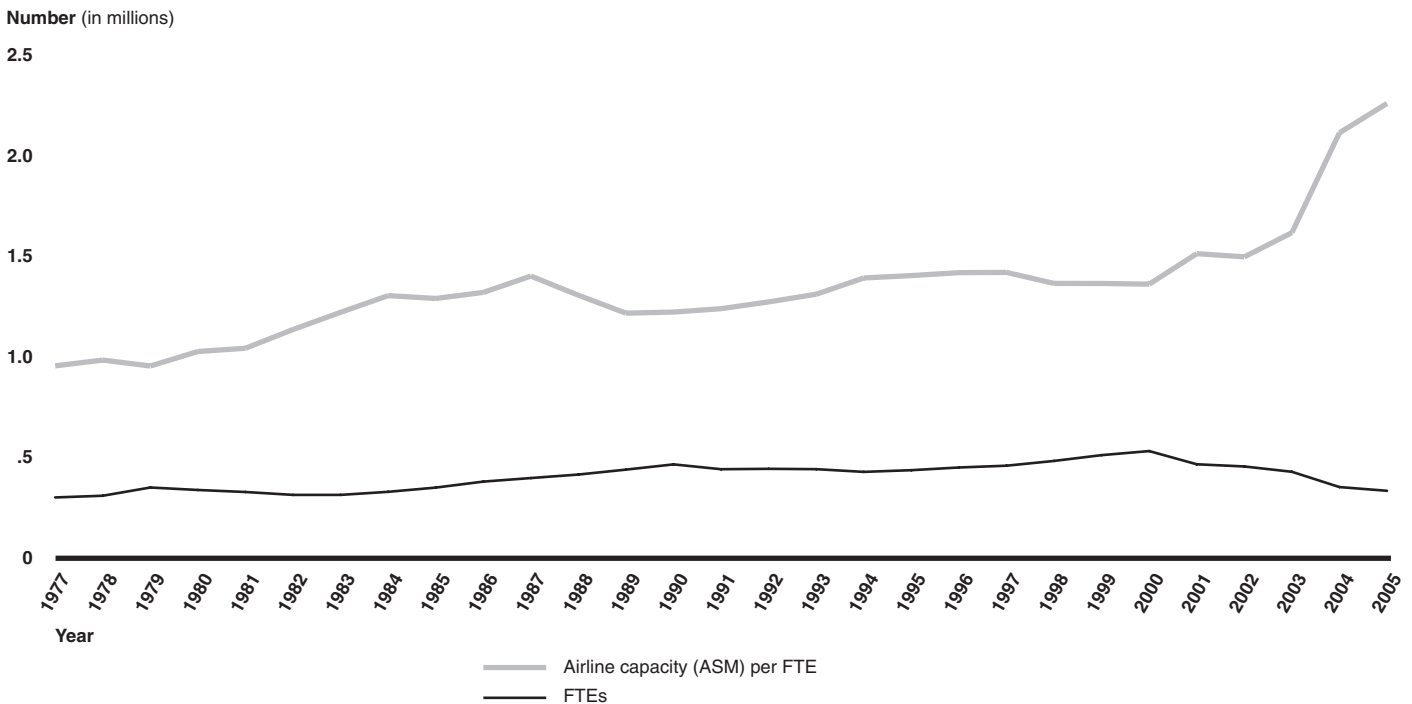
**Figure 5: Airline Employee Compensation as a Share of Total Operating Expenses, 1968–2005**



Source: GAO analysis of DOT Form 41 data.

Note: U.S. Domestic airlines, excluding cargo.

**Figure 6: Airline Industry Employment and Capacity (ASM) Per Employee, 1977–2005**



Source: GAO analysis of DOT Form 41 data.

Note: Domestic airlines, excluding cargo. The total for full-time equivalencies (FTE) are the sum of all full-time employees and one-half of all part-time employees.

### Legacy Airlines Remained Dominant until 2000, When Low-Cost Airlines Increased Market Share

Following deregulation, legacy airlines were considerably larger and better financed than the host of small new airlines that entered the market place. Most of the new entrant airlines during the 1980s and 1990s failed. Large legacy airlines were generally able to retain market share despite new entrant airlines because of operating barriers—such as slot controls—and business practices—such as frequent flyer programs—that gave them competitive advantages. Larger and better-capitalized legacy airlines seeking to increase market share acquired weaker airlines—for example, American Airlines’ acquisition of Reno Air. Legacy airlines built up their hub-and-spoke networks, which allowed them to build their traffic flows and fend off potential competitors. We and others reported on the higher fares experienced by passengers that had to use these “fortress hubs.” Legacy airlines also developed regional, national, and international code-sharing arrangements to extend their networks and compete for domestic and international passenger traffic. During the 1990s, we repeatedly

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reported on these and other barriers to entry that limited competition in the U.S. airline industry.<sup>11</sup>

Since the industry downturn that began in 2000, there has been a shift in the airline industry: a weakening of the financial condition of legacy airlines and an increasing market share for low-cost carriers. The consequences of an overburdened cost structure for legacy airlines became apparent after 2000 when demand fell, especially demand from premium-fare business travelers. Low-cost airlines, which generally did not have these cost structures, have been able to increase their market share, while legacy airlines have struggled to bring their costs down. As we reported in 2004, low-cost airlines increased their presence in the top 5,000 domestic city-pair markets by 44.5 percent; from 1,594 markets in 1998 to 2,304 markets in 2003.<sup>12</sup> In 1998, low-cost airlines operated in 31.5 percent of markets served by legacy airlines, providing a low-cost airline alternative to 72.5 percent of passengers. By 2003, low-cost airlines competed directly with legacy airlines in 45.5 percent of markets served by legacy airlines, serving 84.6 percent of passengers in the top 5,000 markets. While legacy airlines began to reduce their operating costs starting in 2001, they did so through capacity reductions and were not able to reduce their unit costs vis-à-vis low-cost airlines that were adding capacity.<sup>13</sup> We warned that legacy airlines could not survive with continued losses. In 2005, two legacy airlines (Delta and Northwest) entered bankruptcy and are currently attempting to reorganize.

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## Bankruptcy Has Been Used to Terminate Defined Benefit Pension Plans

In 2005, we examined the issue of airline bankruptcy and, in particular, how some airlines were using bankruptcy to terminate their defined benefit pension plans. We found that bankruptcy has been endemic to the airline industry since deregulation, with 162 bankruptcy filings since 1978, owing to the fundamental financial weaknesses of the airline industry.

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<sup>11</sup>GAO, *Airline Competition: Effects of Airline Market Concentration and Barriers to Entry on Airfares*, [GAO/RCED-91-101](#) (Washington, D.C.: April 26, 1991); *Airline Competition: Higher Fares and Less Competition Continue at Concentrated Airports*, [GAO/RCED-93-171](#) (Washington, D.C.: July 15, 1993); *Airline Deregulation: Changes in Airfares, Service Quality, and Barriers to Entry*, [GAO/RCED-99-92](#) (Washington, D.C.: March 4, 1999).

<sup>12</sup>In 2003, the top 5,000 city-pair markets accounted for 92 percent of domestic passenger traffic.

<sup>13</sup>GAO, *Commercial Airlines: Legacy Airlines Must Further Reduce Costs to Restore Profitability*, [GAO-04-836](#) (Washington, D.C.: Aug. 11, 2004).

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Despite the prevalence of bankruptcy, however, we found no evidence that bankruptcy harmed the airline industry by contributing to overcapacity or by underpricing. Nevertheless, we expressed concern about the use of bankruptcy to terminate defined benefit pension plans because of the costs to the federal government as well as to employees and beneficiaries. USAirways and United, subjected to intense cost pressures from growing low-cost airlines like Southwest, entered bankruptcy and terminated their labor contracts and pension plans. The pension plan terminations cost PBGC nearly \$10 billion and plan participants lost more than \$5 billion in promised benefits that are not covered by PBGC.<sup>14</sup> If Delta and Northwest, which entered bankruptcy in 2005, similarly terminate their pension plans, the costs to PBGC and plan participants will be even greater. At present, only American Airlines and Continental have active defined benefit pension plans, while the remaining airline plans are either terminated or frozen.<sup>15</sup> In total, active and frozen airline plans were underfunded by almost \$15 billion at the end of 2005, according to Securities and Exchange Commission filings.

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## Real Fares Have Declined and Service Has Expanded since 1980

Airfares have fallen in real terms over time, with round-trip median fares almost 40 percent lower since 1980.<sup>16</sup> However, fares in short-distance markets (less than 250 miles) and “thin” markets (the bottom 20 percent of passenger traffic) have not fallen as much as those for longer distances or in heavily traveled markets. Price dispersion—that is, the extent to which passengers in the same city-pair market pay different fares—has also declined since 2003, likely indicating consumers’ unwillingness to pay the very high fares airlines were able to charge in the late 1990s. The extent to which these benefits are attributable to deregulation as opposed to other factors, such as advances in technology, is uncertain. Various studies have attributed significant consumer benefit to deregulation, but estimating this benefit depends on several major assumptions and is not free of controversy. The decline in fares coincided with a growth in passenger

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<sup>14</sup>PBGC may pay only a portion of the benefits originally promised to employees and retirees. For 2006, the maximum statutory limit of annual benefits guaranteed by PBGC is \$47,659.08, for retirement at age 65. The amount paid decreases at earlier retirement ages.

<sup>15</sup>Aloha, Alaska, Delta, Hawaiian, and Northwest airlines have frozen their defined benefit pension plans. Continental Airlines has frozen its pilots’ plan. Freezing a plan means that no additional benefits accrue, but assets and liabilities (and, therefore, the plan’s funded status) can change. USAirways and United’s plans were terminated and the remaining assets and benefit obligations were assumed by PBGC.

<sup>16</sup>We analyzed changes in fares in constant 2005 dollars.

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traffic and increased competition over the period. While large communities and markets have experienced large gains in the number of passengers and service, as well as increased competition, small communities and markets have experienced much smaller gains. On average, however, the number of competitors in city-pair markets grew from 2.2 in 1980 to 3.5 in 2005.

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### Real Fares Have Declined, but Declines Have Varied by Market

Our analysis of DOT's ticketing data from 1980 to 2005 shows substantial decreases in median fares since 1980, with an overall decrease of nearly 40 percent for median round-trip fares since that time. In addition, our analysis shows a convergence of fares across trip distances, although substantial differences in fares by trip length and by market size remain. In recent years, passengers flying long distances or in medium to large markets have paid much lower fares as compared with 1980 fares, while those flying in smaller markets or over shorter distances today have seen a smaller reduction in fares as compared with 1980 fares. Finally, the difference between the fares paid by customers flying within the same routes began to decline in 2003, after increasing in the years following deregulation.

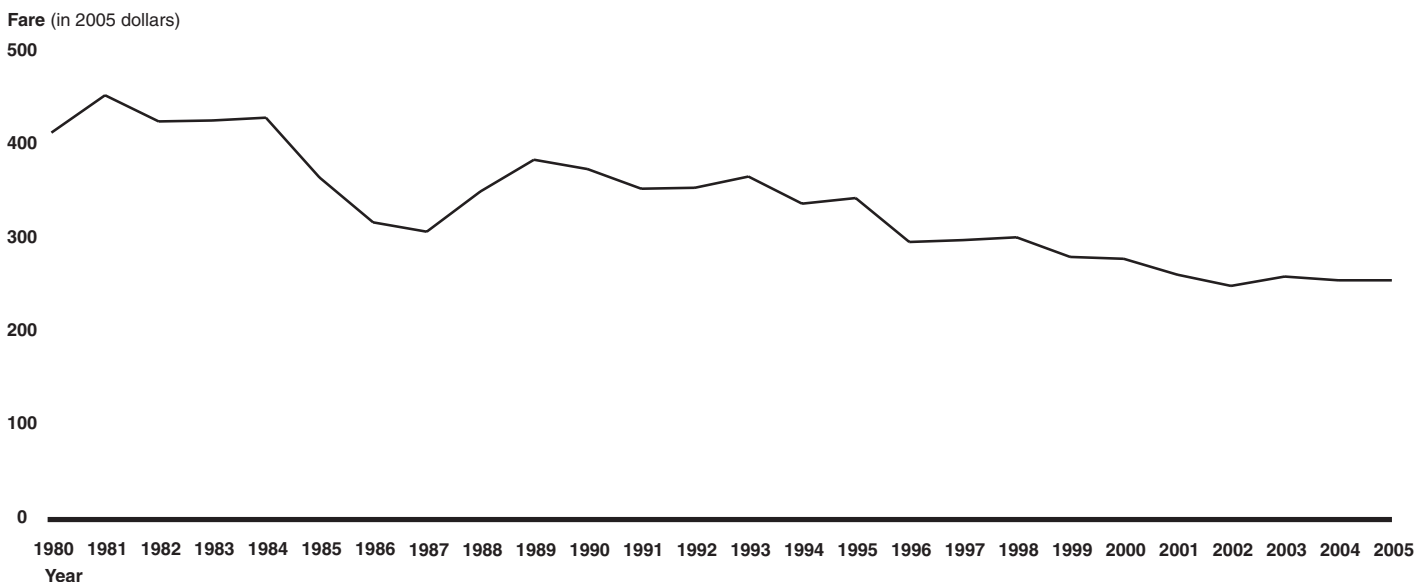
Overall, median round-trip fares have declined 38 percent since 1980, falling from \$414 to \$256.<sup>17</sup> The largest decreases occurred in the late 1980s, but the overall trends have continued down in subsequent years.<sup>18</sup> Figure 7 provides information about median round-trip fares.

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<sup>17</sup>We are reporting data for round-trip itineraries flown on domestic airlines as collected in DOT's Origin and Destination Survey. These data do not include information for tickets reported by Southwest Airlines before the third quarter of 1998, however. Until that time, the airline followed nonstandard reporting procedures and reported all itineraries as one-way trips. Thus, round-trip itineraries were reported as two separate one-way trips. Generally, median round-trip fares since 1999 have been between \$17 and \$25 lower with the inclusion of the Southwest Airlines fares than they would have been without the Southwest fares. For more information about the effects of Southwest's reporting process, see appendix I.

<sup>18</sup>Median round-trip fares per mile, or yields, also dropped substantially, decreasing over 50 percent in the same time period from 32 to 15 cents per mile.

**Figure 7: Median Round-Trip Fare, 1980–2005**



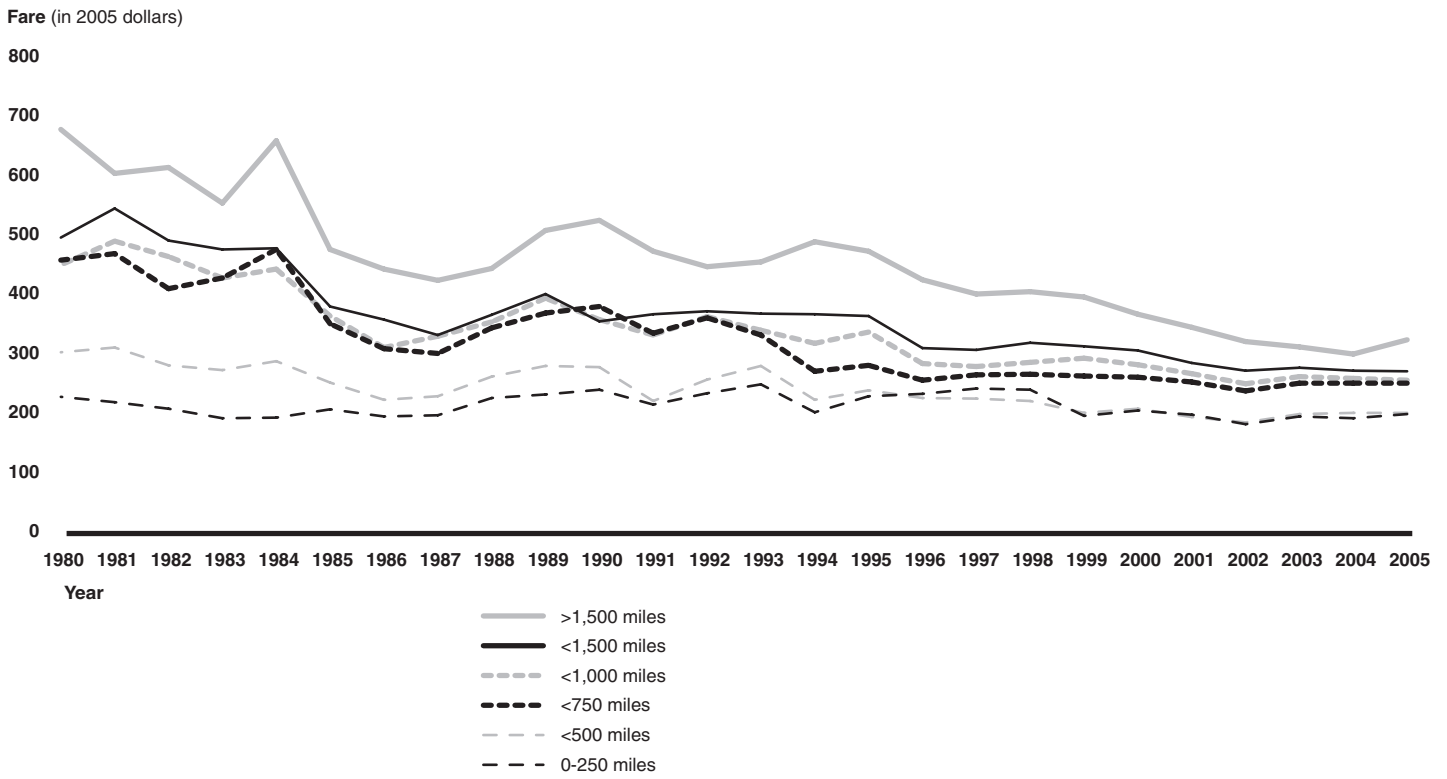
Source: GAO analysis of DOT Origin and Destination Survey data.

Median fares have converged when compared by the distance traveled since deregulation. In 1980, median fares ranged from \$680 for trips longer than 1,500 miles to \$230 for trips of 250 miles or less— reflecting the pricing structure in place under regulation, which linked fares to costs while subsidizing shorter routes.<sup>19</sup> Since that time, however, fares have converged toward the low end of this range, with the longest trips now averaging just \$326, a drop of 52 percent. Median fares for the shortest trips, in contrast, have not fallen as much. For trips of 250 miles or less, median fares have fallen 13 percent to \$201. Figure 8 provides information about median fares by distance categories.

<sup>19</sup>Under regulation, shorter trips were effectively subsidized by longer-haul routes, given that CAB set fares relatively lower in short-haul markets in the belief that passengers traveling shorter distances would not choose air travel if they had to pay the full cost of service.



**Figure 8: Round-Trip Median Fares, 1980–2005**



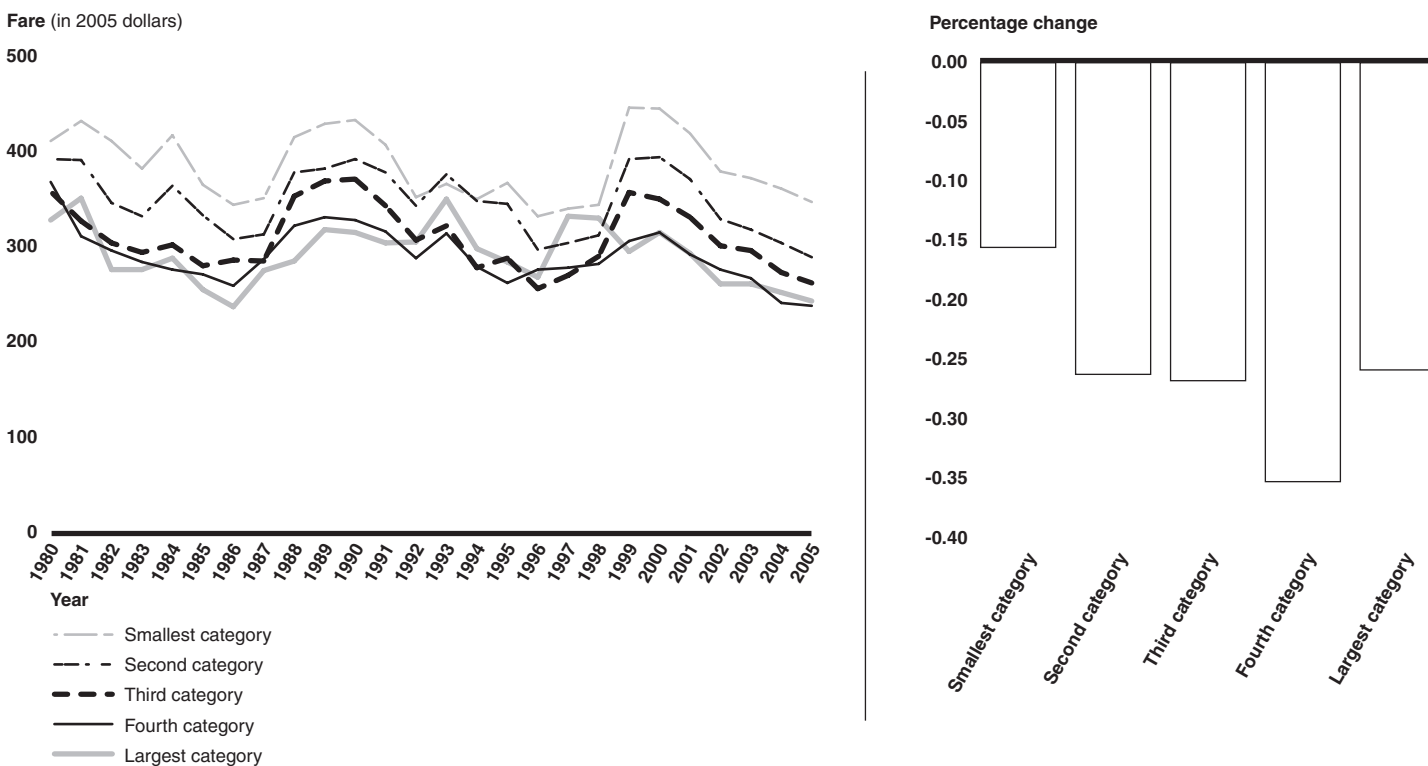
Source: GAO analysis of DOT Origin and Destination Survey data.

The size of the market has also affected how fares have changed since deregulation.<sup>20</sup> The smallest markets continue to have the highest average fares, and have seen the smallest reduction in these fares (see fig. 9). In 1980, passengers flying in the smallest markets paid \$412 on average for their tickets, while those flying in the largest markets paid \$329. By 2005 average fares in the smallest markets had fallen 16 percent to \$348, while passengers in the other markets we analyzed saw their fares fall 26 percent or more on average. Examples of city pairs in the smallest-market category

<sup>20</sup>We divided city-pair markets into five categories based on the number of passengers in each with the number of passengers roughly equal in each category. In 1980, the quintiles averaged just over 452,000 passengers, and the smallest quintile accounted for 85 percent of the 7,739 markets included in our analysis. By 2005, the categories averaged just over 1.1 million passengers, and nearly 90 percent of the 12,090 markets were in the smallest quintile.

in both 1980 and 2005 include the Atlanta, Georgia–Joplin, Missouri route; and the Great Falls, Montana–Sacramento, California route. In contrast, the Boston, Massachusetts–New York, New York route; and the Chicago, Illinois–Los Angeles, California route, were in the largest-market category in both 1980 and 2005.

**Figure 9: Mean Fares by Market Size, 1980–2005**



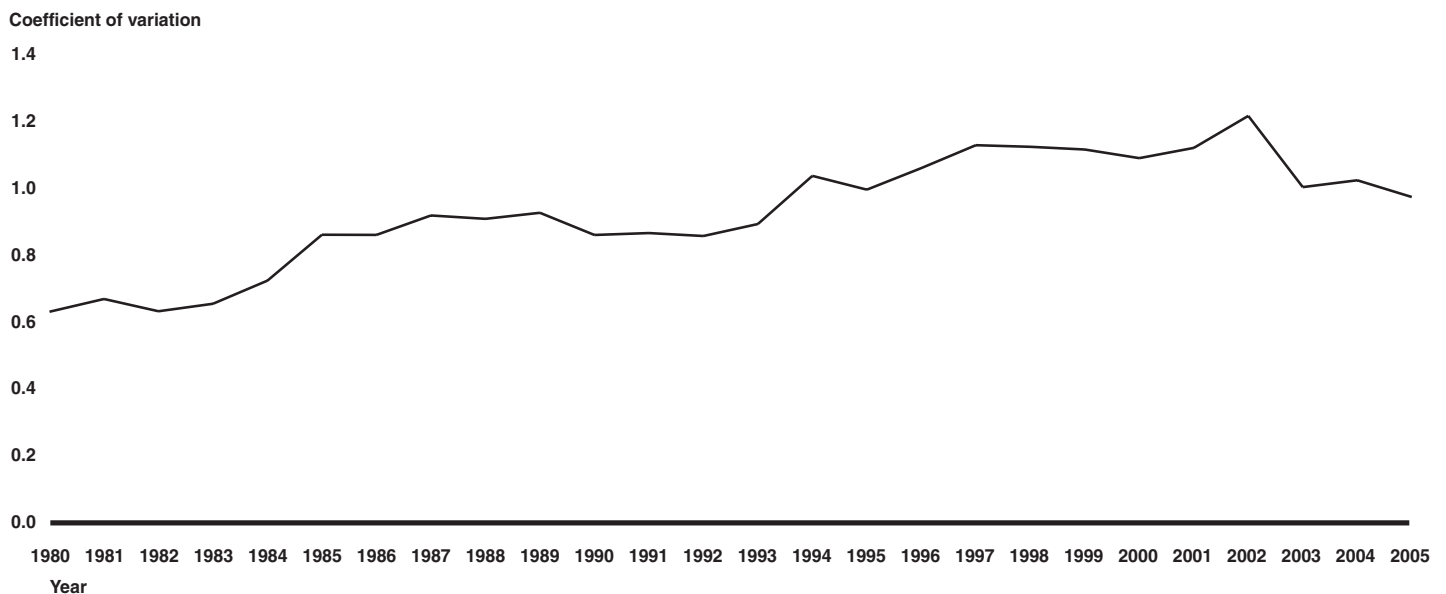
Source: GAO analysis of DOT Origin and Destination Survey data.

While median fares trended down steadily after deregulation, the differences in the prices paid by individual customers in the same city-pair market grew, most notably in the 1990s with the increased use of yield-management systems by airlines.<sup>21</sup> The dispersion of fares began to decline

<sup>21</sup>Yield management (also known as "revenue management" or "real-time pricing") is a pricing policy for optimizing profits generated by the sale of a product or service by segmenting markets, based on real-time modeling and forecasting of demand behavior per market micro-segment.

in 2003, however, when changes in the overall economy and a decline in the willingness of some passengers to pay higher fares for premium service—notably business passengers—likely combined with the increased use of the Internet for ticket purchases to reverse some of the prior increases in ticketing variation. Since then, the variability of fares has decreased, meaning that fares for most tickets sold are now generally more similar to average fares.<sup>22</sup> Figure 10 illustrates the coefficient of variation, or dispersion, of round-trip yields.<sup>23</sup>

**Figure 10: Dispersion of Yields within Routes (Coefficient of Variation), 1980–2005**



Source: GAO analysis of DOT Origin and Destination Survey Data.

Note: The coefficient of variation is the standard deviation divided by the mean.

<sup>22</sup>The dispersion or variability of fares is measured as the coefficient of variation, which is the standard deviation divided by the mean. It provides a measure of the difference from the mean—or average—fare. We examined the coefficient of variation within routes to account for variations in the price per mile paid by customers in the same city-pair markets.

<sup>23</sup>Price per mile, or yield, standardizes revenue by distance, allowing for the comparison of fares paid without regard to the length of trip.

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## Studies Have Found Fare Reductions but Vary in the Degree to Which They Credit Deregulation

Many studies have estimated that consumers have benefited from deregulation. Assessments of these benefits, however, vary substantially as have the methodologies used. One approach is to calculate the difference between actual fares and a benchmark proxy measure of what fares might have been had the industry remained regulated. Any differences are then attributed to the effects of deregulation. Some studies using this approach have used the Standard Industry Fare Level (SIFL) to approximate the regulated fare and concluded that consumers as a whole have benefited from lower fares resulting from deregulation.<sup>24</sup> For example, in 2005 Rose and Borenstein compared postderegulation fares to the SIFL and estimated that 2004 fares were about 30 percent lower than what the comparative regulated fares would have been, resulting in a \$5 billion savings to passengers that year.<sup>25</sup> Likewise, Winston and Morrison used the same proxy in 1995 and estimated that real fares declined about 33 percent from 1976 to 1993. After adjusting the SIFL data to account for presumed productivity gains and increased load factors,<sup>26</sup> they estimated that, on average, deregulation led to fares 22 percent lower than they would have been in a regulated environment, resulting in an annual savings of about \$12.4 billion in 1993 dollars over the same period.<sup>27</sup> While pointing to declines in overall fares, these studies also indicated that benefits have been unevenly distributed by market size and route length. In fact, those traveling on heavily traveled routes are likely to be paying less than they would have paid under a regulated system, and those flying on shorter-distance routes are likely to be paying more.

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<sup>24</sup>SIFL fare data are available at approximately 6-month increments from the Office of Aviation Analysis. They are updated to reflect changes in airline operating costs per available seat-mile (ASM), and are intended to approximate unrestricted coach fares. They are used by the Internal Revenue Service to impute the value of free transportation provided on corporate aircraft.

<sup>25</sup>Severin Borenstein and Nancy Rose, "Regulatory Reform in the Airline Industry" (paper prepared for the National Bureau of Economic Research Conference on Regulation, Sept. 2005).

<sup>26</sup>Load factor is a measure of the percentage of seats filled. Load factor is calculated by dividing RPM by ASM.

<sup>27</sup>Winston and Morrison adjusted the provided SIFL data by 1.2 percent, accounting for a 1.45 percent increase in costs from greater efficiency through 1983 and a 0.25 percent decrease for higher load factors. For more information, see Steven A. Morrison and Clifford Winston, *The Evolution of the Airline Industry*, first edition (Washington, D.C.: The Brookings Institution, 1995).

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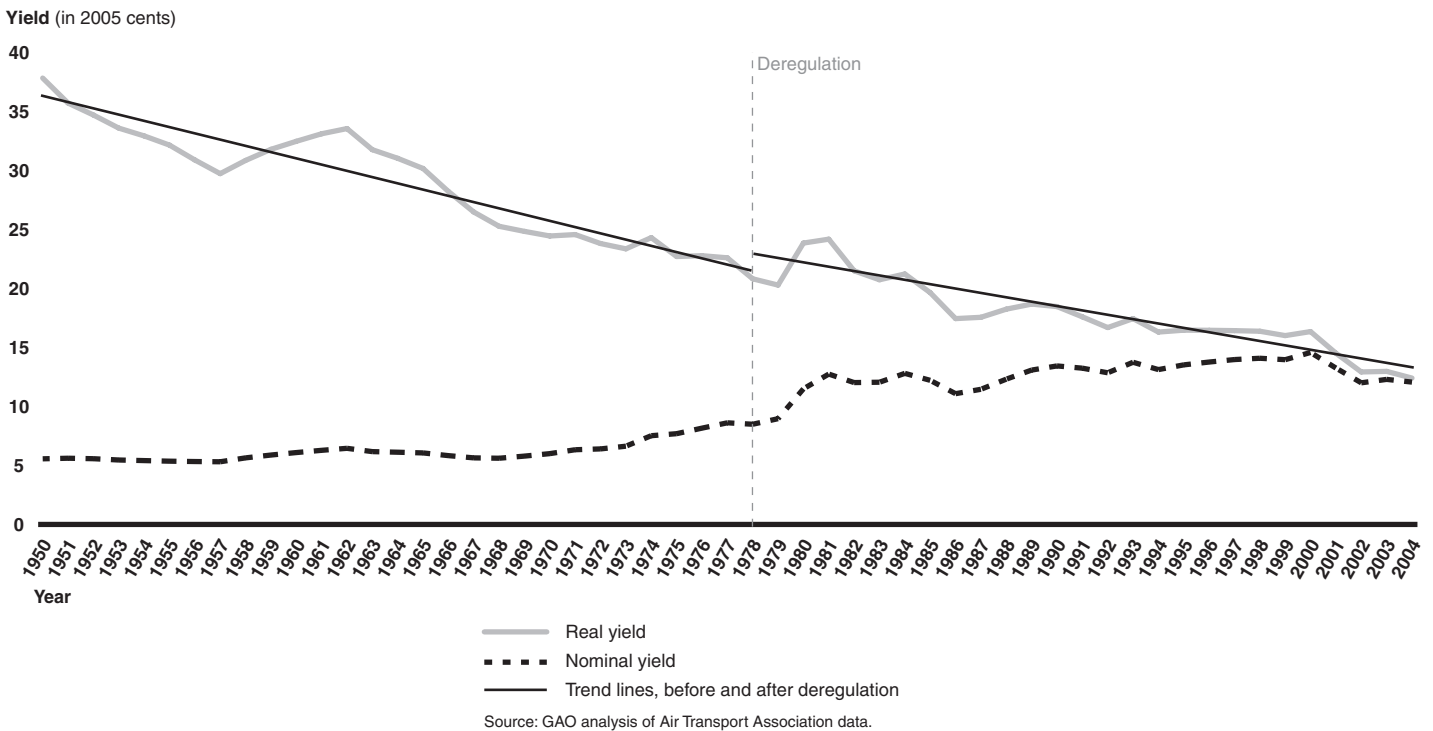
Some experts have questioned the extent to which deregulation can be credited for decreases in airfares since 1978, and draw attention to the difficulty in measuring impact. First, a former CAB and DOT official, who participated in CAB route awards and fare determinations and later calculated the SIFL for DOT, points out that the fare ceilings used by CAB under regulation—calculated as the Domestic Passenger Fare Investigation (DPFI)—were more complicated than their proxies. Rose and Borenstein also acknowledged that using the SIFL as a proxy for the CAB regulated fare may be increasingly implausible, given that it is unlikely that the same cost assumptions would have been used for the 27 years following deregulation. As a result, using the SIFL to approximate airline fares under regulation may overestimate the savings resulting from deregulation. For example, while the DPFI fare calculations took several factors into account, including depreciation and capacity, the SIFL calculations primarily consider airline costs.<sup>28</sup> The former DOT official further noted that the DPFI calculations allowed for discounted fares if load factors were increased to offset the fare reduction, something not reflected by the SIFL fare. Second, some experts have pointed out that fares were already declining before deregulation, thus making it difficult to attribute changes in the industry to deregulation rather than improvements in productivity and other factors.<sup>29</sup> In fact, real average fares paid per mile (yields) since 1962 do show a steady decline, reflecting both CAB fare setting flexibility and cost-savings following the introduction of jet service in the early 1960s, but without a sharp break in 1978 following the deregulation of the industry (see fig. 11).

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<sup>28</sup>The DPFI fare calculations took several factors into account including revenue, expenses, depreciation, capacity, seating arrangement, equipment type, and load factors. They were based on reported traffic levels for any fare class accounting for at least 5 percent of revenue passenger miles. The DPFI fare served as a fare ceiling based on a 55-percent load factor and a standard seating adjustment.

<sup>29</sup>See Paul Stephen Dempsey, *Flying Blind: The Failure of Airline Deregulation*. (Washington, D.C.: Economic Policy Institute, 1990).

**Figure 11: Real Yield Trends, 1950–2004**



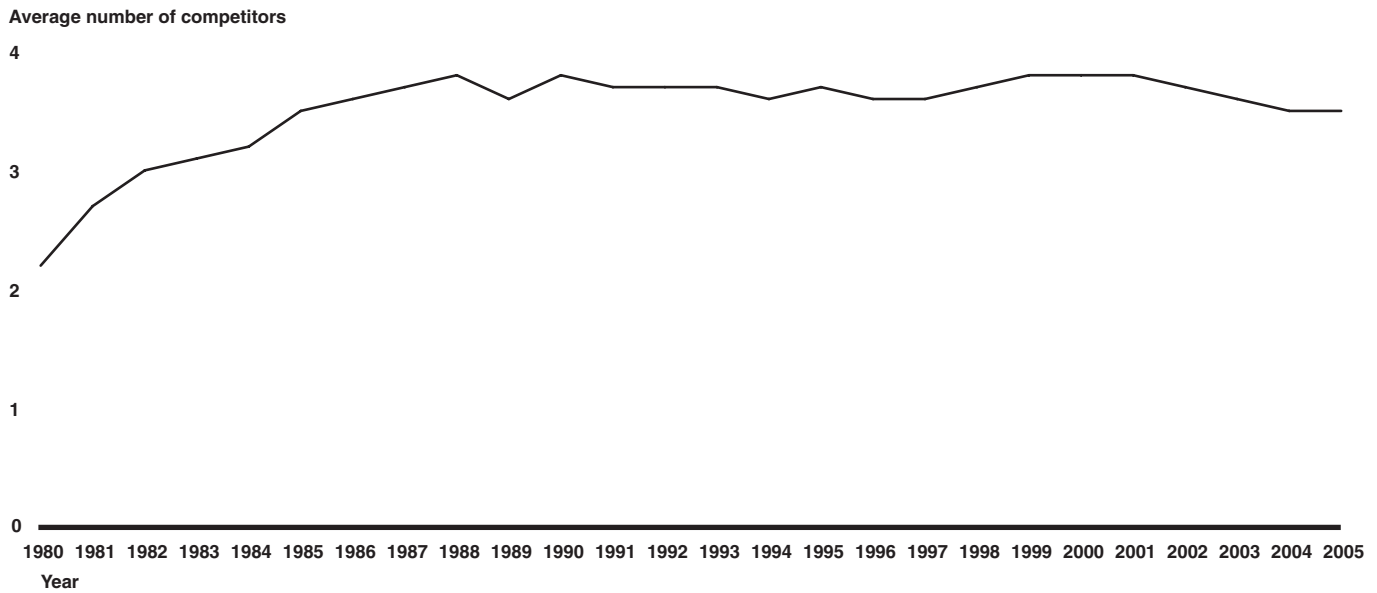
### Airline Traffic Has Grown and Markets Are More Competitive, Though to a Lesser Degree in Small Markets

As predicted by deregulation, airline city-pair markets have become more competitive since deregulation. As shown in figure 12, the average number of effective competitors (any airline that carries at least 5 percent of the traffic in that market) in any city pair increased from 2.2 in 1980 to 3.5 in 2005.<sup>30</sup> By 2005, 76 percent of the city-pair markets we analyzed had three or more carriers compared with 34 percent of all city-pair markets in 1980 (see fig. 13). By contrast, the percentage of city-pair markets with only one carrier decreased from 20 percent in 1980 to 5 percent in 2005. As these two figures show, most of the increase in competition occurred during the 1980s, just after deregulation.

<sup>30</sup>Because of statistical sampling issues, we analyzed competition only in city pairs with at least 118 passengers in our sample in any given quarter. This equates to about 1,180 actual flying passengers.

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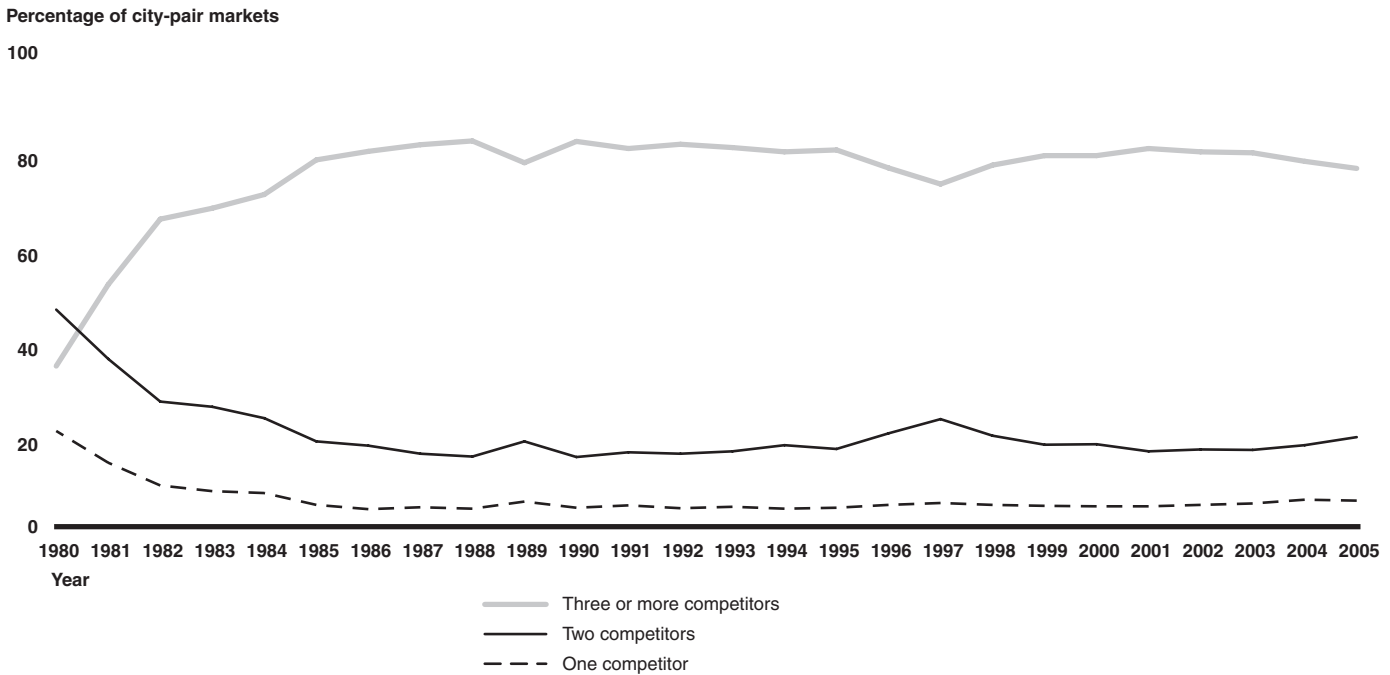
**Figure 12: Average Number of Effective Competitors, 1980–2005**



Source: GAO analysis of DOT Origin and Destination Survey data.

Note: Because of statistical sampling issues, we only analyzed competition in city pairs with at least 118 passengers in our sample in any given quarter. This equates to about 1,180 actual flying passengers per quarter.

**Figure 13: Percentage of Markets by Number of Effective Competitors, 1980–2005**



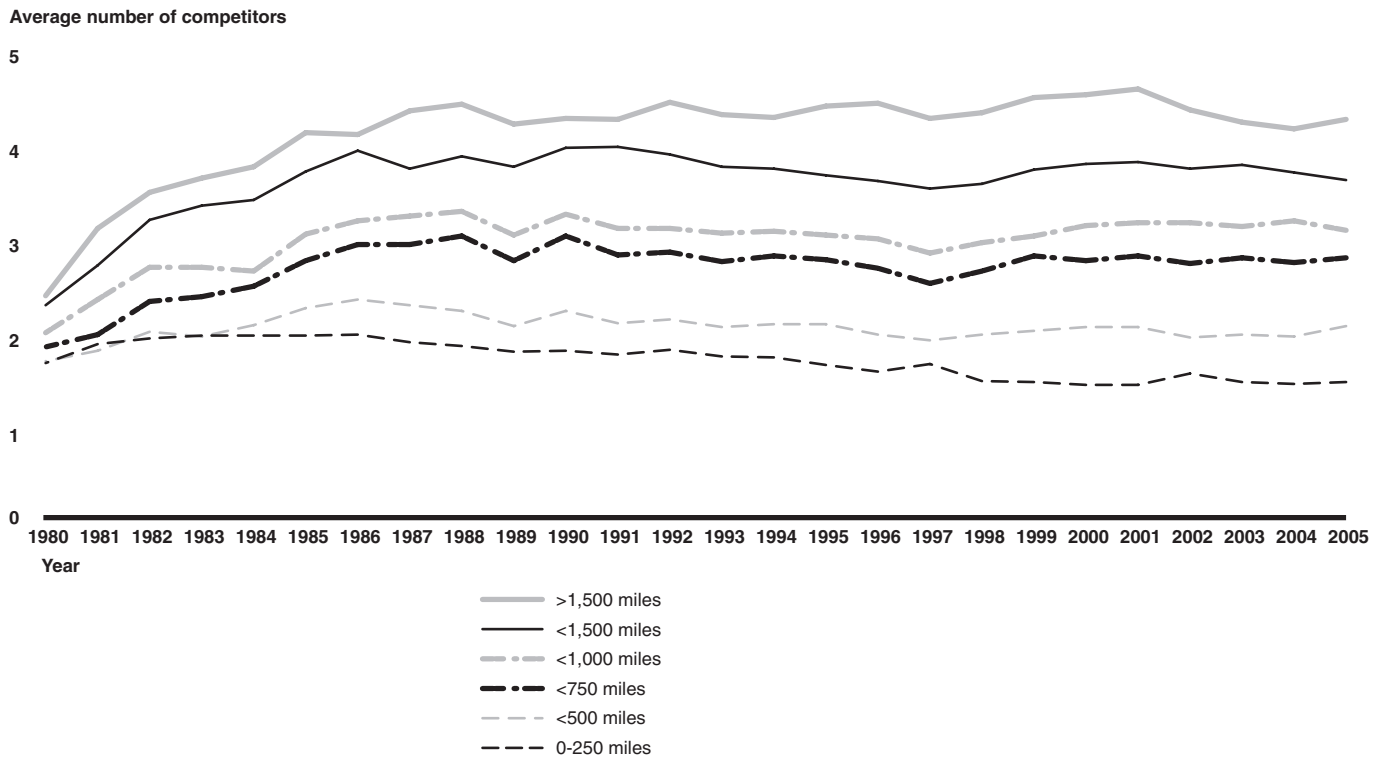
Source: GAO analysis of DOT Origin and Destination Survey data.

Note: Because of statistical sampling issues, we only analyzed competition in city pairs with at least 118 passengers in our sample in any given quarter. This equates to about 1,180 actual flying passengers per quarter.

Longer-distance markets are more competitive than shorter-distance markets, some of which have lost competitors since 1980. While city pairs with a distance of over 1,500 miles have seen an increase in the average number of carriers from 2.3 in 1980 to 4.2 in 2005, markets shorter than 250 miles have seen a decrease from 1.6 in 1980 to 1.4 in 2005 (see fig. 14). This difference exists in large part because longer-distance markets have more viable options for connecting over more hubs. For example, a passenger on a long-haul flight from Harrisburg, Pennsylvania, to Seattle, Washington (a distance of over 2,000 miles), would have options of connecting through six different hubs, including Cincinnati, Chicago, and Detroit. By comparison, a passenger from Harrisburg to Rochester, New York (a distance of just over 200 miles), has three viable connecting options.



**Figure 14: Average Number of Effective Competitors by Distance Traveled, 1980–2005**



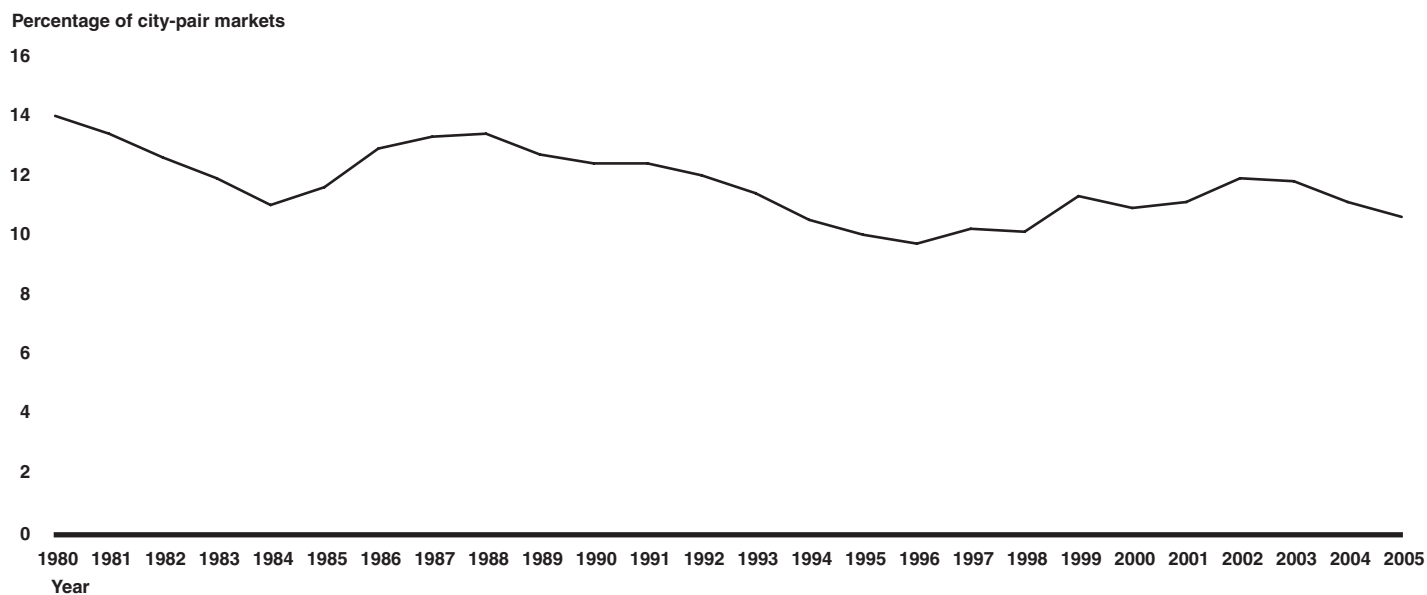
Source: GAO analysis of DOT Origin and Destination Survey data.

Note: Because of statistical sampling issues, we only analyzed competition in city pairs with at least 118 passengers in our sample in any given quarter. This equates to about 1,180 actual flying passengers per quarter.

### Passenger Traffic Is More Concentrated despite Growth in the Number of City Pairs since 1980

Passenger traffic, already concentrated in relatively few city-pair markets in 1980, has become more concentrated. In 1980, 80 percent of passenger traffic occurred in the largest 14.1 percent of all city-pair markets, but by 2005, that same percentage of traffic occurred in the largest 10.7 percent of all city-pair markets (see fig. 15). While large markets have seen substantial gains in traffic, smaller markets have not, and in many cases have actually seen declines in traffic since deregulation. For example, while the number of passengers flying between Washington, D.C., and Los Angeles grew 327 percent between 1980 and 2005 in our sample, the number traveling between Boston and Cedar Rapids, Iowa, decreased 49 percent.

**Figure 15: Percentage of Airline City-Pair Markets with 80 Percent of Passengers, 1980–2005**



Source: GAO analysis of DOT Origin and Destination Survey data.

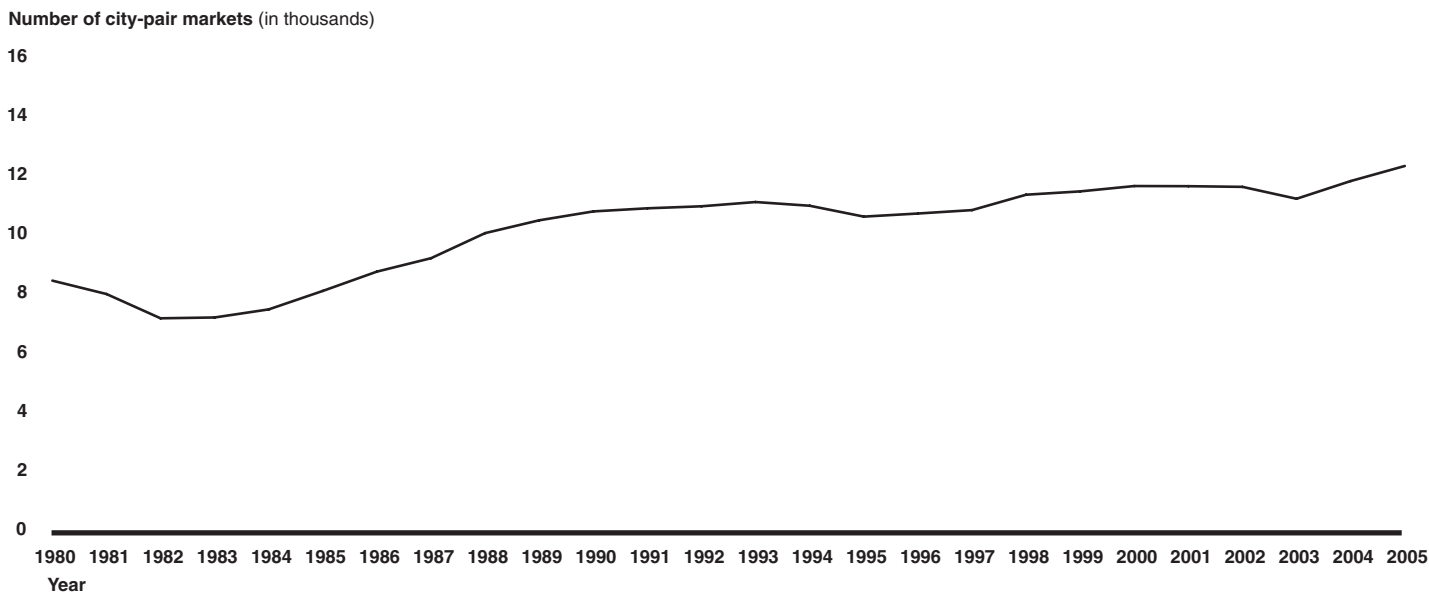
Note: Because of statistical sampling issues, we only analyzed service in city pairs with at least 13 passengers in our sample in any given quarter. This equates to about 130 actual flying passengers per quarter.

The number of city-pair markets has increased modestly since 1980. Largely owing to an overall growth in traffic, the number of city pairs with at least 13 passengers in the sample per quarter (which equates to about 130 actual passengers per quarter) increased by over 3,800 city-pair markets between 1980 and 2005, from about 8,500 to over 12,300 (see fig. 16).<sup>31</sup> However, few cities have gained air service since deregulation because the airport system was already largely developed at the time of deregulation, so the number of cities that could be connected would not be expected to have changed much since deregulation. Instead, many city-

<sup>31</sup>In analyzing service measures, we counted only city-pair markets with at least 13 passengers per quarter in our sample, which equates to about 130 actual flying passengers. This was to increase the probability that changes in service we observed in our sample reflected actual flow routes and was not due to sampling or data error. In 2005, 99 percent of passengers in our sample were in those city-pair markets with at least 13 passengers in the sample.

pair markets that could be connected did not have enough actual passengers reflected in the sample data to be counted.<sup>32</sup>

**Figure 16: Number of City-Pair Markets with at Least 130 Passengers per Quarter, 1980–2005**



Source: GAO analysis of DOT Origin and Destination Survey data.

**Notes:**

- (1) Our analysis includes only one-way tickets with a maximum of three coupons and round-trip tickets with two, four, or six coupons. A coupon is issued for each segment of an itinerary so that a passenger connecting once on a one-way flight is issued two coupons.
- (2) Because of statistical sampling issues, we only analyzed service in city pairs with at least 13 passengers in our sample in any given quarter. This equates to about 130 actual flying passengers per quarter.

**Smaller Communities Have Not Experienced Comparable Benefits since Deregulation**

Smaller communities, in general, have not experienced the same increases in traffic and air service as larger cities since deregulation—particularly in recent years, when many small cities lost service or experienced a decline in the number of departures. For example, we reported in 2005 that while large, medium, and small-hub airports have seen traffic rebound since

<sup>32</sup>For example, a passenger could fly between the two small EAS cities of Crescent City, California, and Presque Isle, Maine, with a sufficient number of connections, but it is unlikely that many passengers have done so or, if they have, that they would be in the sample.

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September 11, 2001, nonhub airports had 17 percent fewer flights in July 2005 than in July 2000.<sup>33</sup> Additionally, we reported in 2002 that traffic at EAS communities decreased 20 percent from 1995 to 2002. However, lack of service for small communities is not solely a problem of the deregulated era. We reported in 1985 that in the 10 years leading up to deregulation, 137 small communities lost all commercial air service.

The primary reason for diminished service to smaller communities is the lack of a population base to support that service. Local air traffic is directly related to both local population and employment. For small communities located close to larger cities, these demand reductions are exacerbated because local passengers drive to airports in larger cities to access better service and lower fares. We reported in 2002 that some EAS airports serve only about 10 percent of the intercity traffic to and from their city because many travelers instead drive to alternative airports or to their destination. Small communities have not benefited from the service of low-cost carriers; as we reported in 2005 only 5 of over 500 nonhub airports received low-cost carrier service. Lack of service from low-cost airlines can partially explain why small cities also face relatively higher fares than larger cities do.

Similarly, longer-distance markets have seen greater gains in traffic than shorter-distance markets. Passengers on routes of 1,500 (or more) miles increased 312 percent between 1980 and 2005, while passengers on routes between 250 and 499 miles grew 68 percent in our sample. For example, while traffic between Dallas-Fort Worth, Texas, and Hartford, Connecticut—a distance of 1,470 miles—grew 477 percent between 1980 and 2005, traffic between New York and Raleigh-Durham, North Carolina—a distance of 427 miles—fell 19 percent in our sample. Short-distance markets lost a large share of their passengers after September 11, 2001, in part because the increased time required for security measures makes driving a more viable alternative. The frequency of short-haul flights has also decreased. DOT found that the number of scheduled flights under 250 miles decreased 26 percent between July 2000 and July 2005,

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<sup>33</sup>The FAA classifies airports based on an airport's total enplanements as a percentage of the total in the United States in any year. Large hubs are those with at least 1 percent of total enplanements, medium hubs with between 0.25 percent and 1 percent of enplanements, small hubs with between 0.05 percent and 0.25 percent of enplanements, and nonhubs as those with less than 0.05 percent of total enplanements.

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while the number of flights of over 1,000 miles increased by 15 percent during that time.<sup>34</sup>

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### The Average Number of Connections per City-Pair Market Has Increased Since Deregulation

Our analysis indicates that the average number of connections needed, at a minimum, to connect any two cities has increased since 1980. Figure 17 shows the percentage of all city-pair markets in our sample with at least 13 passengers per quarter (or 130 actual passengers) that can be connected nonstop, with one connection, or with two connections.<sup>35</sup> Very few city-pair markets currently require two connections. The average number of connections needed to connect any two city-pair markets increased from 1.6 in 1980 to 1.7 in 2005, which is likely attributable to the development of hub-and-spoke networks to connect airline traffic. For some passengers this development has increased the number of connections needed. For example, in 1980, passengers traveling between Philadelphia, Pennsylvania, and Tulsa, Oklahoma, could fly nonstop, but by 2005 one connection was required. While there may have been declines in nonstop connectivity for many small city-pair markets, the overall ability of passengers to connect to wider markets through hubs has likely improved. The shift from shorter-range turboprop planes to longer-range regional jets has allowed cities that are too small to support mainline jet service, but too far from hubs for turboprop service, to be connected to hubs, increasing the number of one-connection city-pair opportunities.<sup>36</sup>

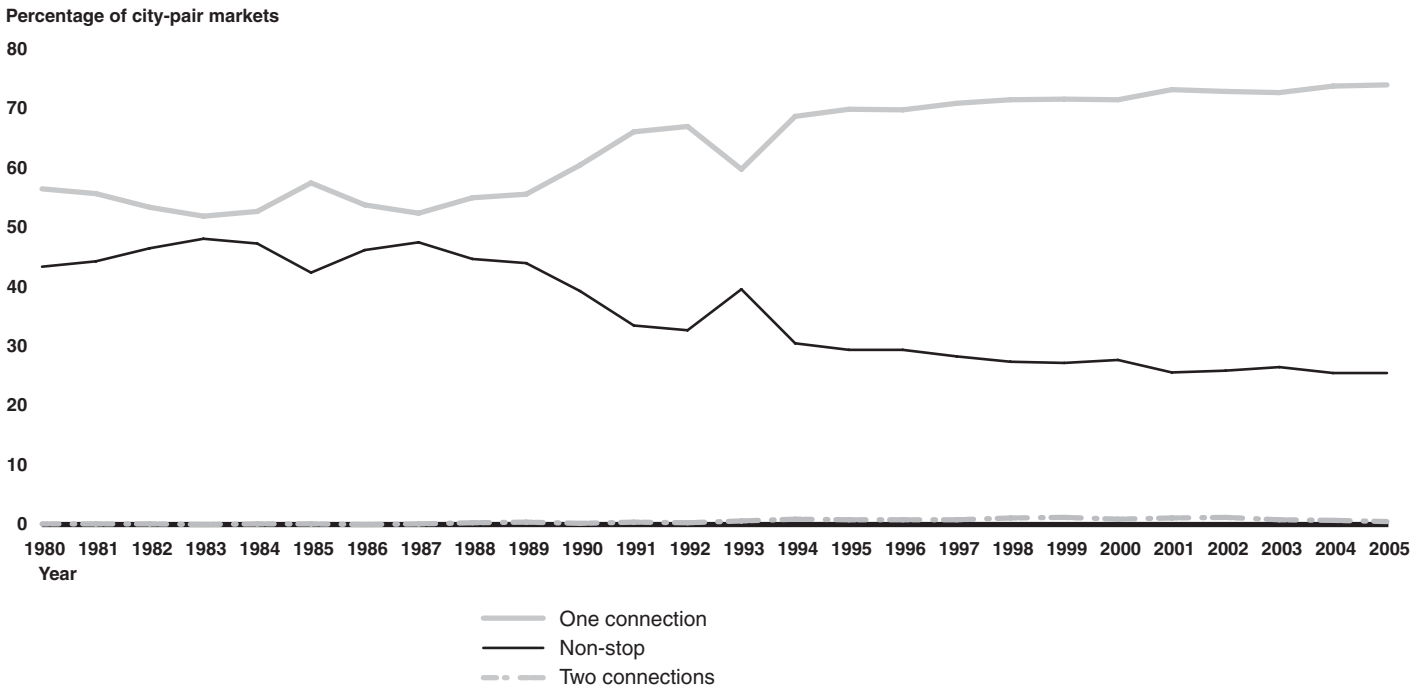
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<sup>34</sup>DOT, *Aviation Industry Performance: Trends in Demand and Capacity, Aviation System Performance, Airline Finances, and Service to Small Airports*, CC-2005-057 (Washington, D.C.: June 30, 2005), p. 13.

<sup>35</sup>Our data counted the number of coupons, or “flight segments,” per ticket. While a one-coupon trip would not require a passenger to connect between two different planes at an intermediate hub, it does not necessarily mean that the flight is nonstop. A passenger on a flight that makes a stop and then continues with the same flight number to a different destination would be considered as having been on a nonstop flight. There is no way to determine the number of passengers in our data sample that this scenario applies to.

<sup>36</sup>GAO, *Aviation Competition: Regional Jet Service Yet to Reach Many Small Communities*, GAO-01-344 (Washington, D.C.: Feb. 14, 2001). We reported in 2001 on airlines’ use of regional jets to provide service in new markets that were more distant than previous markets served with shorter-range turboprop service. For example, regional jet service was used by American Airlines in 1999 to directly connect Grand Rapids, Michigan, to Dallas, Texas, whereas previously American only served Grand Rapids with turboprop service to Chicago, Illinois. These new, longer, nonstop markets have increased the flight opportunities for many communities by connecting them directly with a greater number of hub airports.

**Figure 17: Percentage of Markets and the Minimum Number of Connections, 1980–2005**



Note: Because of statistical sampling issues, we only analyzed service in city pairs with at least 13 passengers in our sample in any given quarter. This equates to about 130 actual flying passengers.

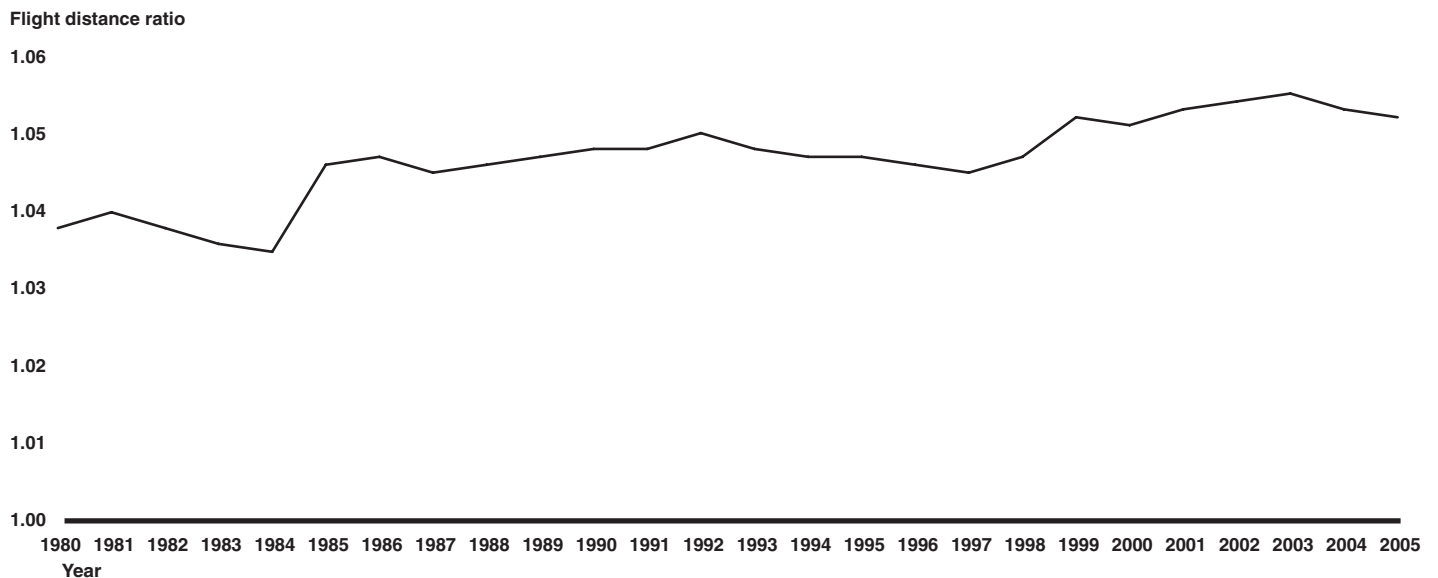
The largest markets are generally served by nonstop service. In 2005, 88 percent of passengers traveled in city-pair markets that included nonstop service and less than 1 percent of passengers traveled in city-pair markets that required two connections.<sup>37</sup> However, because many passengers in directly connected markets may choose to fly with a connection (e.g., in exchange for a lower fare), the actual number of passengers flying without a connection is lower. For example, while passengers flying between Seattle and Tampa, Florida, could fly nonstop in 2005 (and were able to in 1980), they could also choose to connect through a number of hubs,

<sup>37</sup>City pairs with under 13 passengers per quarter were not included in this analysis due to sampling issues. It is likely that many of those markets, due to their small size, require at least one connection.

including Chicago, Atlanta, and Denver, Colorado, for a number of reasons. Our data do not distinguish between passengers who flew with one or two connections out of necessity (e.g., because of no better option in their market) or voluntarily when a direct flight was available. Additionally, the development of hubs has helped bring about increases in flight frequencies, allowing some passengers taking connecting flights to benefit from better flight times and reduced connection times.

As another means of measuring changes to connectivity over time, we calculated a flight distance ratio. This ratio, also known as “circuitry,” measures the total miles flown on a trip (adding up the distance of all segments of a flight) divided by the distance between origin and destination. A nonstop flight would have a ratio of 1, and a ticket with at least one stop would have a higher ratio the farther out of the way the connections were between origin and destination. Figure 18 shows that, since 1980, the flight distance ratio has slowly risen. Much of this increase is likely due to the increased use of connecting flights.

**Figure 18: Flight Distance Ratio, 1980–2005**



Source: GAO analysis of DOT Origin and Destination Survey data.

By other measures of airline service—not covered by DOT’s Origin and Destination Survey data such as flight frequencies, flight delays, and amenities—service has been mixed. For example, in 1999 we reported that

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medium and large communities had significant improvements in their number of departures, nonstop destinations served, and use of jet service since deregulation.<sup>38</sup> However, by other measures, service has deteriorated, especially in recent years as traffic has rebounded. For example, DOT has reported that 77.4 percent of flights arrived ontime in 2005, compared with 82.1 percent in 2002 and 79.4 percent in 1990. Additionally, DOT reported that the agency received almost 7,000 consumer complaints in 2005, an increase of over 50 percent from 2003.<sup>39</sup>

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## Evidence Suggests That Reregulation of Airline Entry and Rates Would Reverse Consumer Benefits and Not Save Airline Pensions

According to our analysis of the evidence, reregulation of airline entry and rates would not benefit consumers and the airline industry. Although some aspects of customer service might improve, reregulation would likely reverse many of the gains made by consumers, especially lower fares. While numerous industries have been deregulated over the last 30 years, very few have been reregulated. We found that the few instances in which an industry was reregulated stemmed from inadequate competition, such as occurred in the cable television industry after it was deregulated. Lack of competition has not been the case in the airline industry, where competition has been keen. Our analysis of fares and service since deregulation provides evidence that consumers have benefited over the intervening years. While it is impossible to accurately calculate these gains because no regulated system exists against which to compare deregulated fares, deregulation has corresponded with increased competition in the airline industry, which has likely contributed to lower fares and a larger airline market than might have prevailed without it. Reregulating the airline industry would have ramifications reaching far beyond the fare and service effects on airline passengers and communities. For example, the higher fares for airline travel that would likely result from reregulating the industry could shift some of the nation's 670 million domestic airline passengers to other modes of transportation that are neither as safe nor efficient as air travel, and considerable infrastructure investment would be required to handle the increased demand.

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<sup>38</sup>This report defined large communities as those with metropolitan populations of over 1.5 million people, medium-large communities as those with metropolitan populations between 600,000 and 1.5 million people, medium communities as those with metropolitan populations between 300,001 and 600,000 people, and small communities as those with metropolitan populations of 300,000 or less.

<sup>39</sup>The number reported by DOT is based on formal complaints filed by consumers with the DOT.



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Restoring service to some small communities is an insufficient reason to reregulate airline entry and rates. We previously reported that small communities face a range of fundamental economic challenges in attracting and retaining commercial air service. Among these challenges is the lack of a population base or economic activity that could generate sufficient passenger demand to make service profitable to airlines. Smaller communities located near larger airports may also face reduced demand because they do not have low-cost airlines or frequent service. Despite these challenges, smaller city-pair markets have generally experienced lower fares since deregulation—just not to the degree that the largest city-pair markets have. The smallest city-pair markets in our analysis have also experienced a net gain in the number of connections and in overall traffic since deregulation. If Congress determines that these markets are underserved, it might more directly address service to small communities through targeted legislation—such as increasing subsidies for EAS—than through wholesale reregulation.

Finally, reregulating the airline industry would not salvage airline pensions. Legacy airlines' financial problems are the result of the same competitive forces that contributed to lower fares for consumers. The demise of airlines since deregulation has been endemic to the airline industry, as more efficient airlines have taken market share from less efficient airlines. As we found in our 2005 report on airline bankruptcies and pension problems, pension losses were attributable to market forces, poor airline management and union decisions, and inadequate pension funding rules—including insufficient funding requirements and the inadequate relationship between premiums paid by plan sponsors and PBGC's exposure to financial risk. These factors also led to the termination of pensions in other industries with large legacy pension costs, such as steel. Increasing fares via government-imposed price floors similar to those that existed prior to 1978 would be an inefficient means of ensuring that airlines would generate sufficient revenues to adequately fund their pension plans, especially when most airlines no longer offer defined benefit plans. Congress is currently considering changes to defined benefit pension regulation, including specific provisions that would grant airlines additional time to fund frozen defined benefit plans and thereby avoid plan terminations. We have previously recommended that Congress consider broad pension reform that is comprehensive in scope and balanced in effect.

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## Agency Comments

We provided a draft of this report to DOT for its review and comment. DOT officials provided some clarifying and technical comments that we incorporated where appropriate.

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We provided copies of this report to the Secretary of Transportation and other interested parties and will make copies available to others upon request. In addition, this report will be available at no charge on our Web site at <http://www.gao.gov>.

If you or your staff have any questions on matters discussed in this report, please contact me on (202) 512-2834 or at [heckerj@gao.gov](mailto:heckerj@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report can be found in appendix II.



JayEtta Z. Hecker  
Director, Physical Infrastructure

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# Appendix I: Scope and Methodology

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To assess the original intent of Congress in passing the Airline Deregulation Act, we reviewed the act and accompanying legislative materials, and various other documents and studies. To ascertain the legislative intent of Congress in deregulating the airline industry, we reviewed the act, legislative reports, and floor debates. We also reviewed related court cases and studies and historical accounts of airline deregulation.

To evaluate past changes in the airline industry, we reviewed Department of Transportation (DOT) studies, our own studies, analyzed financial and operational data, and interviewed industry experts. We analyzed airline financial and operational data from DOT's Form 41 data set. We obtained these data from BACK Aviation Solutions, a private contractor that provides online access to U.S. airline financial, operational, and passenger data that are reported by airlines to DOT. To assess the reliability of these data, we reviewed the quality control procedures applied to the data by DOT and BACK Aviation Solutions and subsequently determined that the data were sufficiently reliable for our purposes.

To analyze changes to airline fares and service since deregulation, we used data from DOT's Origin and Destination Survey. Begun in 1979, the Survey captures airline-reported information about the full itinerary and fare paid from every tenth ticket to DOT. The survey does not include data on flight frequency, aircraft type, flight amenities, or other data that could be used to measure airline service. In the fourth quarter of 1998 DOT changed the name of the database from DB1A to DB1B and began collecting an additional data field to distinguish between the carrier that issued the ticket from the carrier that operated the flight (e.g., a flight operated by Air Wisconsin as a US Airways Express flight, connecting to a US Airways Express flight, connecting to a US Airways mainline flight—all issued by US Airways under the "US" code). To assess the reliability of these data, we reviewed the quality control procedures applied to the data by DOT and subsequently determined that the data were sufficiently reliable for our purposes.

We analyzed these data for the period from 1980 through the second quarter of 2005. We did not include 1979 data in our analysis because DOT staff reported that these data were not reliable, since many airlines had difficulties reporting data in the first full year of deregulation. We limited our analysis to data reported for the second quarter of every calendar year in order to avoid data reflecting increased summer travel or reduced winter travel. Furthermore, we limited our analysis to passenger itineraries wholly within the continental 48 states; thereby excluding

international itineraries and any travel to airports in Alaska, Hawaii, and U.S. dependencies. We excluded international fares and foreign carriers because international markets were not deregulated when domestic markets were. We excluded flights to or from Alaska, Hawaii and U.S. territories because of the long distances involved.

In general, we limited our analysis to a subset of round-trips and certain one-way trips between city pairs. We defined markets by city pairs rather than airport pairs. For cities served by multiple airports (e.g., the Dallas area includes both Dallas-Forth Worth International Airport and Dallas Love Field), we recoded all airports in the city to the one with the most enplanements. Thus, we identified round trips as those for which the final city on the ticket was the same as the originating city (even if the passenger record indicated, for example, that the trip originated at Dallas-Fort Worth and returned to Dallas Love Field). One-way trips were those in which no two cities in the ticket matched one another.

We included only round trips involving two, four, or six flight segments (coupons). These represent round trip itineraries that have no stops, one stop, or two stops in both directions. In counting the number of coupons used in each direction of a flight (i.e., outbound or return), we relied on the “trip break” codes that DOT assigns. These codes indicate the point in a passenger’s itinerary at which the passenger begins the return trip. Because the data originally reported by the airlines do not unambiguously identify the point on a round trip at which the passenger begins the journey home, DOT applies an arithmetic algorithm that identifies the point in the itinerary farthest from the point of origination. However, because DOT’s trip break codes may incorrectly identify the destination airport, we eliminated any tickets that had an unequal number of coupons before and after the DOT-assigned trip break. Thus, we eliminated all 3- and 5-coupon round trip tickets (e.g., one in which a passenger flies nonstop from Boston to Phoenix, Arizona, then to Denver, and back to Boston). On the other hand, we included records for roundtrips that had equal numbers of outbound and return coupons, but connected over different airports on the outbound and return segments (for example, New York to Los Angeles connecting in Chicago westbound and in Dallas-Fort Worth eastbound).

We analyzed changes in fares and yields in inflation-adjusted 2005 dollars, using the chain-weighted price index for gross domestic product. To compute the yield for every ticket, we divided the inflation-adjusted fare paid by the total distance between origin and destination for a one-way ticket or by double the distance between origin and destination for a

round-trip ticket. We excluded tickets with unusually high fares (i.e., those with yields in excess of \$3 per mile in 2005 dollars), because according to industry researchers, these fares are likely to indicate data errors. We retained tickets in the analysis when the fare paid was \$0, indicating trips “purchased” with frequent flyer rewards.

For our analyses of changes in fares and service, we divided city pairs into categories based on distance or passenger density. To determine the distance between city pairs, we calculated the distance between airports using the latitude and longitude of their locations. We then grouped all city pairs into 250-mile or 500-mile increments. We also determined the total number of sample passengers in each market. We then ranked, for each year, all markets by the number of passengers and grouped the markets into quintiles, in which each quintile had an even number of passengers.<sup>1</sup> Because the number of passengers in each market changed from year to year, the specific markets in each quintile also changed from year to year. Our analysis of service measures was conducted by only counting city-pair markets with at least 13 passengers per quarter in our sample, which equates to about 130 actual flying passengers. This was to increase the probability that changes in service we observed in our sample reflected actual flow routes and was not due to sampling or data error.

We defined “service” in terms of connectivity and the number of competitors in a market. We measured connectivity in two ways: the minimum number of flight segments available to connect two cities and the extent to which passengers needed to connect over distant hubs to reach their destination. We identified the minimum number of connections needed to connect any two cities and also determined whether that number changed over time. Additionally, because some passengers will choose to connect between two cities rather than take nonstop flights (e.g., because fares may be cheaper or the schedules may be more convenient), we weighted the coupons by passenger traffic to establish how most passengers traveled in the city pair. To determine whether passengers could fly more or less directly to their destinations, we calculated the distance between origin and destination along with the distance of every segment on the ticket. We then divided the sum of the segment distances by the distance between origin and destination (or

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<sup>1</sup>Quintile breaks did not always result in quintiles that were exactly equal because, often, the smallest pair in the quintile had too many passengers to make the total for the quintile exact.

twice that distance if the flight was a round trip) to estimate how far out of the way the travelers went.

To analyze competition within markets and over time, for every city pair, we determined the market share for each reporting carrier, based on ticketed passengers, and counted only those carriers with at least 5 percent of the market as effective competitors. We excluded tickets with interlined flights in our analysis of city-pair competition. An “interlined flight” is one in which a passenger transfers from one to another unaffiliated carrier. That is, the passenger travels on at least two different reporting carriers. When analyzing city pairs for competition, we only analyzed those city pairs that, in any given quarter, had a minimum of 118 passengers in our sample (equaling a minimum of 1,180 real passengers in the market). This passenger minimum was derived to provide us an acceptably low probability of misclassifying carriers as effective competitors, that is, as having a 5 percent market share. For various scenarios, with this market size threshold, the probability of correctly classifying carriers was at least 95 percent.

We recognize that many other dimensions of service quality exist. In the past, we have reported changes in service quality in terms of available capacity out of particular cities, whether service was provided with jets or turboprop aircraft, and how many locations a passenger from a given city could reach on a nonstop basis. In addition, DOT collects other information on service quality, such as the percentage of on-time arrivals and departures and the number of consumer complaints about airlines. Because of time constraints on this engagement, we were unable to incorporate more of these dimensions in our analysis.

When DOT began requiring the survey data by airlines, Southwest Airlines received a waiver that allowed it to report data differently, because of its unique ticketing procedures, whereby it issued only one-way tickets. Under the waiver, Southwest reported its round trips to DOT as two separate trips, which were included in DOT’s DB1A or DB1B databases. Southwest maintained this waiver until the third quarter of 1998, when it was required to report ticket data more accurately, including both directions of a ticket. During the period covered by the waiver, the number of one-way tickets in the sample was unnaturally high. Recognizing that the data could be biased as a result, we reanalyzed our sample data without the Southwest data and found that the results were only marginally different. Median round-trip fares since 1999 have been between \$17 and \$25 lower with the inclusion of the Southwest Airlines fares than they would have been without the Southwest fares. Therefore,

we did not exclude Southwest tickets after 1999 from our analysis of fares.<sup>2</sup>

To determine whether there is sufficient evidence to support reregulating the airline industry, we considered our findings under the prior questions and our earlier reports, especially those relating to pension regulation. We reviewed and updated the status of airline pension plans and assessed examples of deregulation and reregulation in other countries and in other industries. In addition, we reviewed our prior reports that have evaluated past problems in the airline industry, including small community service, barriers to entry, fare and service problems, and financial problems, including bankruptcy and pension issues. For this and the prior report questions, we reviewed our methods and results with DOT and academic experts from the Massachusetts Institute of Technology's Global Airline Industry Program.

We performed our work between September 2005 and May 2006 in accordance with generally accepted government auditing standards.

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<sup>2</sup>Restrictions in place by the Wright Amendment still mean that Southwest passengers originating at Dallas Love Field and connecting in another airport must buy two separate tickets. As a result, tickets originating at Dallas Love Field will only indicate nonstop flights and may not always accurately reflect the true itineraries of travelers.

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# Appendix II: GAO Contact and Staff Acknowledgments

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## GAO Contact

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## Acknowledgments

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