

## Takeoff and descent of airline employment

*After several years of growth, airline employment declined with the recession of 2001 and the attacks of September 11th; subsequently, although air travel began to rebound, the number of jobs has not recovered fully; in 2008, the industry has faced, soaring fuel prices and a weakening economy*

Christopher J. Goodman

The airline industry in the United States has gone through major changes in recent years. After growing sharply throughout the late 1990s, the industry began to falter around the turn of the century.<sup>1</sup> An economic downturn compounded by the catastrophic events of September 11, 2001, induced the largest decline in air travel in modern aviation. By 2003, air travel was once again growing<sup>2</sup>; however, the industry's fiscal position continued to deteriorate. In the face of mounting financial losses, the airlines aimed to reduce their expenditures on labor, leading to massive job losses in the industry. Airlines were hampered in their restructuring efforts by historically high fuel prices, which added further pressure to reduce employment. During the period from 2003 to 2006, the historical relationship between passenger volume and employment in the industry broke down. From its peak in March 2001, employment in the industry declined for 5 straight years.<sup>3</sup> The industry did not begin to show signs of a recovery until 2007.

### Structure of the airline industry

The passenger airline industry can be divided roughly into three categories: network, or "legacy," carriers; discount, or low-cost,

carriers; and regional carriers. Legacy carriers constitute the industry's largest airlines. Responsible for the majority of passenger transportation, they are longstanding airlines that began operations prior to deregulation in 1978. Noted for their large domestic networks, they have traditionally offered many services not found on lower cost carriers, such as first class seating and membership clubs. As a result, network carriers have continued to remain popular with business travelers. They are also the primary conduit for international travel and are noted for their extensive hub-and-spoke networks. Each of these networks generally routes passengers to one of the airline's major hubs, where the passengers then fly on to their ultimate destination. Since 2000, these airlines have suffered financially as they have gradually lost market share to discount and regional carriers.

Discount carriers, the second major group, have arisen largely since the Airline Deregulation Act of 1978. Discount carriers are noted for offering low fares and basic, or "no frills," services. Eschewing the hub-and-spoke model of larger airlines, discounters concentrate on point-to-point service. Focusing on the domestic passenger market, these carriers typically fly to fewer cities than the major airlines and do not of-

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**Table 1. Airline revenues, expenses, and net profits, 1995–2007**

[In millions of dollars]

Year	Revenues	Expenses	Net profits
1995 .....	95,117	92,804	2,314
1996 .....	102,444	99,717	2,727
1997 .....	109,917	104,799	5,119
1998 .....	113,810	108,963	4,847
1999 .....	119,455	114,178	5,277
2000 .....	130,839	128,352	2,486
2001 .....	115,527	123,802	-8,275
2002 .....	106,985	117,994	-11,008
2003 .....	117,920	120,291	-2,371
2004 .....	134,462	142,105	-7,643
2005 .....	151,255	157,037	-5,782
2006 .....	164,615	161,492	3,123
2007 .....	172,989	167,991	4,998

SOURCE: Air Transport Association.

for international flights. Discount carriers have proven to be popular with those traveling for leisure.

The third group responsible for passenger services is the regional carriers. As their name implies, regional carriers generally lack a national presence and instead focus on serving particular geographic regions. Flying smaller airplanes, these carriers service many smaller markets not served by other carriers. Larger carriers often contract with regional carriers to provide service on less popular routes, where demand is not sufficient to fill larger planes. Regional airlines have experienced the most rapid passenger growth in recent years. The Federal Aviation Administration projects that the market share of regional carriers will expand from 11.9 percent of passengers in 2020 to 19.9 percent in 2015, making these carriers an increasingly important component of air travel.<sup>4</sup>

### Expansion in the late 1990s

Air transportation experienced a steady increase in passenger volume throughout the latter half of the 1990s, because a growing national population and a robust economy led more people to travel for business and pleasure.<sup>5</sup> Demand for air travel continued to grow as personal income in America rose and airline travel became relatively more affordable. The airline industry was by and large profitable, and it experienced healthy employment growth. From January 1995 until January 2000, employment in air transportation expanded by nearly one-fifth, or 97,000 positions.

By the late 1990s, the effects of Internet commerce were starting to be felt across the industry. Travel Web sites allowed consumers to more easily compare air fares,

limiting the pricing power of airlines.<sup>6</sup> The Internet provided airlines with a low cost channel for selling tickets and allowed airlines to increase the total number of tickets sold. Given the low marginal cost of each additional passenger, airlines were able to profit even when selling surplus tickets at greatly reduced rates. (See table 1.)<sup>7</sup>

Throughout the 1990s, the airline industry was able to prosper thanks to historically low fuel prices and increases in passenger volumes. Both of these factors contributed to low per-passenger operating costs, which enabled airlines to reduce fares in an attempt to lure still more passengers.<sup>8</sup> From 1995 to 2000, revenue passenger miles, the most common measure of demand for air travel, rose 28.1 percent. Revenue passenger miles are roughly equal to the number of tickets sold times the average mile per ticket sold.<sup>9</sup> The industry thrived financially during this time period, recording a profit every year from 1995 to 2000. Cumulatively, the airlines recorded profits of more than \$20 billion in the second half of the 1990s and together experienced a 37.6-percent increase in revenue from 1995 to 2000.<sup>10</sup>

### Rapid growth in discount carriers

Although all categories of air carriers expanded in response to growing demand for air travel, discount carriers, in particular, experienced robust growth. During the 1990s, discount airlines grew both in size and in number as they successfully attempted to win market share from the larger companies. Responding to the competitive pressures posed by their upstart rivals, traditional airlines took steps to mimic discount carriers, including decreasing fares to remain competitive. Several sought to head off competition from low-cost carriers by introducing their own discount airlines.

Two factors enabled the discount carriers to grow during this period. Nearly a generation earlier, deregulation had made entrance into the industry easier, giving airlines more latitude in setting prices and lessening the previously onerous process of acquiring regulatory approval to operate new airlines. Additionally, the growth of U.S. capital markets in the 1990s allowed upstart airlines to obtain the vast sums of financial capital necessary to enter the marketplace. Investors eagerly funded new airlines on the premise that upstart airlines, flying direct flights with new fleets and low unit labor costs, would easily unseat older airlines.<sup>11</sup>

Also during the 1990s, many observers of the airline industry believed that the “legacy” carriers were inefficient and would be unable to compete with the newer, leaner

airlines in a price war. According to critics, traditional airlines were burdened with aging fleets and inefficient hub-and-spoke networks. A study by the consulting firm Booz Allen Hamilton found that the discount carriers spent on average only 7 cents to 8 cents per seat-mile to complete a 500- to 600-mile flight, whereas the established carriers spent approximately 15 cents. The analysis also concluded that up to 65 percent of the difference in cost could be attributed to the operational complexity associated with managing a hub-and-spoke model.<sup>12</sup> High labor costs were also seen as a competitive disadvantage for the legacy carriers. It was widely believed that the heavily unionized industry was paying its employees above market wages, a vestige of the prederegulation era.<sup>13</sup>

The effect of discount carriers on the overall market for air travel was large, and it has generally been considered to have been financially beneficial for consumers. After rising moderately during the early 1990s, airfares remained relatively flat over the course of the late 1990s as low-cost carriers introduced lower fares and legacy carriers responded in kind. Only by 1999, after several years of growth in air travel, did real airfares begin to rise again. (See chart 1.)<sup>14</sup> One study that examined the competitive effect of Southwest Airlines, a large discount carrier, estimated that in 1998 the increased price competition induced by the airline's low-cost model had saved consumers more than \$12.9 billion in airfares across all carriers. Total consumer savings in 1998 were estimated to have been equal to 20 percent of the industry's domestic scheduled passenger revenue and more than half as large as the savings associated with deregulation.<sup>15</sup>

The addition of extra capacity by both large and small carriers caused employment to rise across the airline industry. By March 2001, employment in all of air transportation reached its peak, at 634,000 positions.<sup>16</sup> In the previous 5 years, air transportation had added 110,000 jobs. While they were under pressure from the smaller airlines, the legacy carriers still continued to report healthy financial results and continued plans for further expansion. Available seat-miles, the most widely accepted measure of supply in the airline industry, expanded by nearly one-fifth (18.6 percent) between 1995 and 2000.<sup>17</sup> Record levels of demand for air travel caused the additional capacity to be utilized quickly. Industry load factors, a measure of capacity utilization, continued to rise as passenger growth exceeded the industry's expansion in carrying capacity.<sup>18</sup>

## The recession of 2001

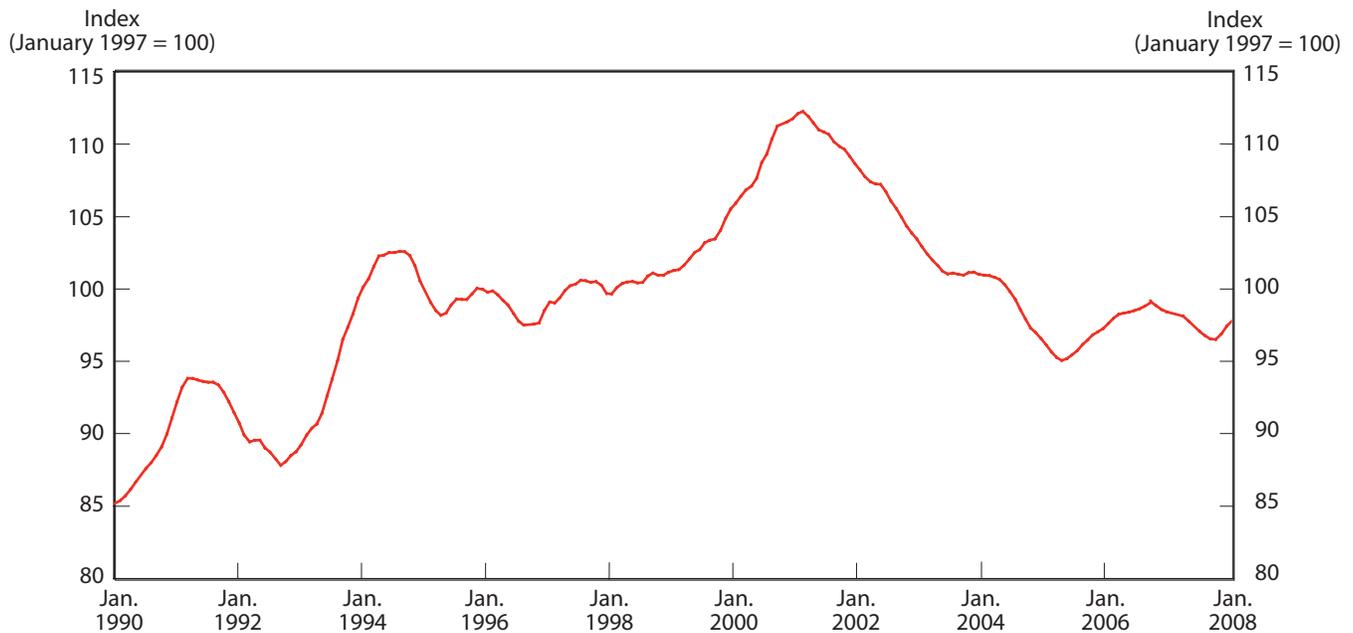
By the second half of 2000, the U.S. economy began to

show signs of slowing. In the third quarter of 2000, gross domestic product (GDP) contracted for the first time in nearly a decade.<sup>19</sup> As the economy weakened, businesses began to reduce staffing levels. The downturn in the broader economy was a major factor in the decline in the demand for air travel, especially the decline among business travelers. Employment in air travel, which had been steadily increasing over the previous 5 years, peaked in March 2001. Over the course of the next 5 months, employment in air transportation edged down as airlines attempted to adjust to the changing market conditions.

The ongoing weakness in the airline industry was compounded by the terrorist attacks of September 11, 2001. Following the attacks, airline travel across the Nation was halted for nearly a week as a precautionary measure. When air travel did resume, airlines experienced a dramatic reduction in passenger traffic; passenger volume on domestic flights declined by 5.9 percent during 2001.<sup>20</sup>

The events of September 11th dramatically changed the public's view of flying. Widespread concerns over the safety of airline travel led Congress to enact new security measures meant to restore the public's confidence. While doing much to assuage lingering fears of flying, the new security procedures dramatically increased the time and effort associated with flying. Passengers were required to arrive earlier and go through enhanced security procedures. The increased security procedures appeared to have effectively calmed the fears that the public had been having about flying. A Gallup survey conducted shortly after the attacks found that more than 80 percent of Americans felt that air travel had become safer since September 11th.<sup>21</sup> However, the increased security appears to have come at a cost to overall customer satisfaction. The University of Michigan's American Customer Satisfaction Index for Airlines, which had been falling in the years prior to the attack, reached its nadir in 2001.<sup>22</sup> The increased time and effort associated with flying not only inconvenienced travelers but also weakened the competitive position of flying relative to other modes of transportation, such as driving or taking a train. Avoiding travel altogether also became more appealing as communication technology, such as teleconferencing, advanced and became more widely available.

Airlines sought to minimize their losses in the face of declining passenger volumes and higher costs. Not only increased security but also higher fuel prices caused this decrease in clientele and increase in costs. Within weeks of the attacks, virtually every major airline had announced drastic layoffs. The BLS Mass Layoff Statistics program reported 75 major layoff events in the 2 months follow-

**Chart 1. Index of real airline fares, 12-month moving average, not seasonally adjusted, 1990–2008**

NOTE: Airline fares deflated by CPI.

SOURCE: BLS Consumer Price Index for All Urban Consumers (CPI-U).

ing the attacks.<sup>23</sup> From September 11th until the end of 2001, overall employment in air transportation declined by an additional 59,000 positions as carriers adjusted to the decline in air travel. (See chart 2.)

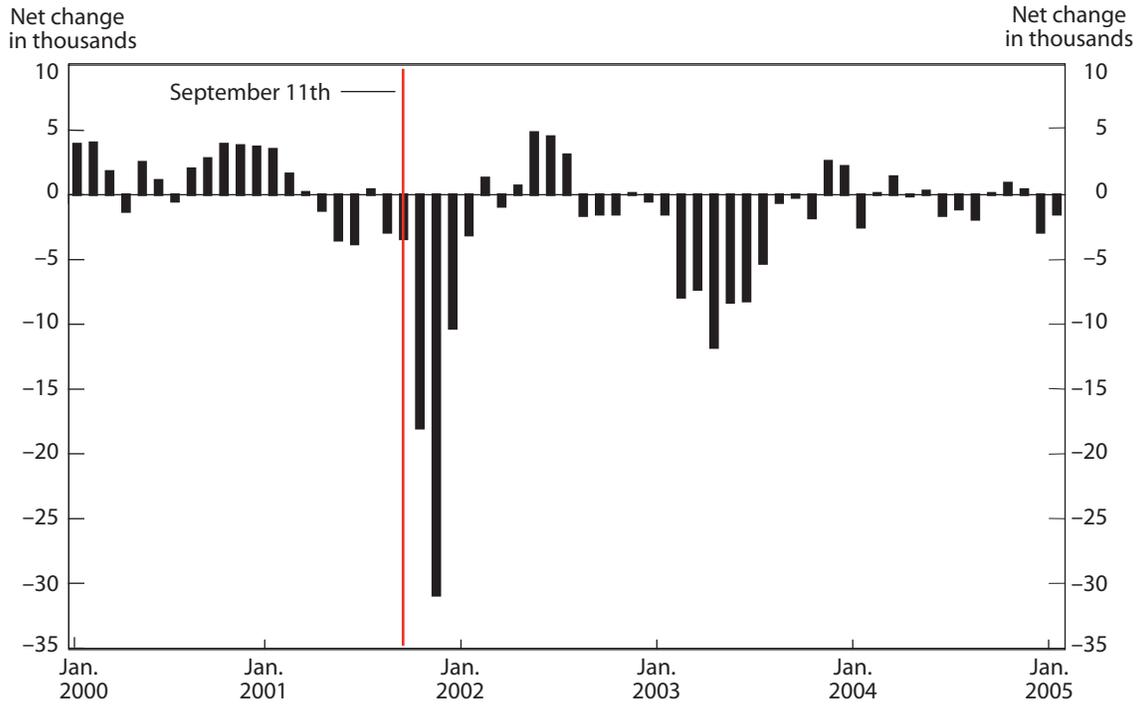
The industry, which had been losing money prior to September 11th, suffered huge financial losses in the wake of the attacks. In 2001, total losses among commercial airlines amounted to \$8.3 billion.<sup>24</sup> According to the industry, the financial damage from the attacks was not confined merely to the losses associated with reduced air travel. Rather, it was argued that the attacks had the potential to threaten, at least in the short term, the financial viability of the entire industry. Two large uncertainties hung over the industry: would the airlines be held legally liable for the attacks? and would insurers be willing to underwrite future policies for the airlines? Air carriers argued that they were near insolvency and would be forced to cease operations if they did not receive outside financial assistance. Sensitive to those concerns, Congress enacted the Air Transportation Safety and System Stabilization Act of 2001. The legislation, which sought to ensure the financial health of the domestic airline industry, provided direct government-backed loans to the airlines. Under the legislation, Congress granted the industry \$5 billion in direct assistance and established a \$10 billion loan fund

for distressed airlines. The act also contained provisions designed to limit the airlines' legal liability for the September 11th attacks.<sup>25</sup>

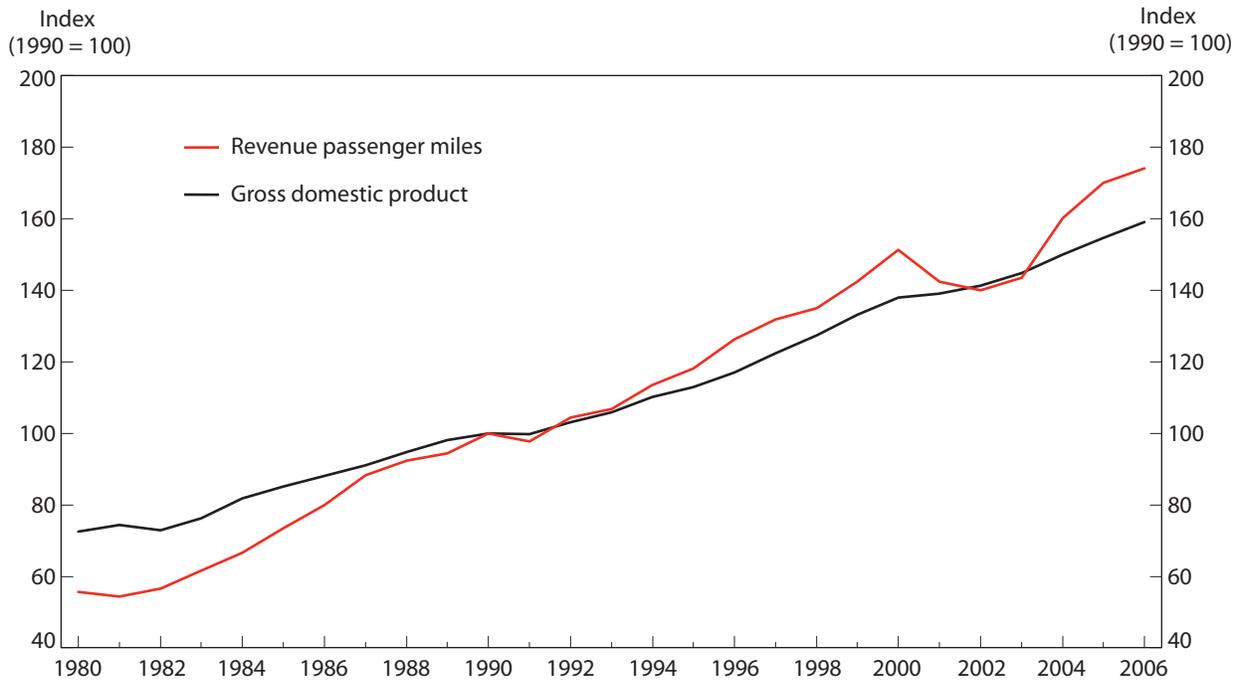
The weak American economy caused air travel to continue its decline through 2002. In the deregulation era, demand for air transportation has generally risen and fallen in line with the broader economy. (See chart 3.) However, the decline in air travel from 2001 to 2002 was especially sharp when compared with previous downturns. Over the course of those 2 years, air traffic, as measured by revenue passenger miles, suffered its worst decline in history, falling by 7.3 percent. This marked only the second time since 1928 that air traffic had declined for 2 consecutive years.<sup>26</sup>

Decreasing numbers of customers caused some airlines to attempt to raise revenue through fare increases, but these increases in price were stiffly resisted by consumers. Unable to raise prices, the airline industry was forced to reduce expenses both through cutting its costs per passenger and by reducing overall capacity. The major expenses that the airline industry regularly faces are labor, fuel, and planes and equipment. In the short term, airlines are constrained in what they can do to limit fuel and equipment costs. With limited room to reduce expenses, airlines attempted to control labor costs. Throughout 2001 and

**Chart 2. Air transportation employment, 1-month net change, seasonally adjusted, 2000–05**



**Chart 3. Indexes of revenue passenger miles and real gross domestic product, 1980–2006**



SOURCES: Air Transport Association and Bureau of Economic Analysis.

2002, employment tracked closely with passenger volume, falling 10.0 percent. However, the employment declines were concentrated in 2001, with employment ticking back up in 2002. (See chart 4.) Overall, the general relationship between employment and revenue passenger miles in 2001 and 2002 appears relatively normal when compared with the historical relationship between the two; as usual, the two series were moving roughly in line with each other during that period. (See chart 5.)

### Air travel recovers, job losses continue

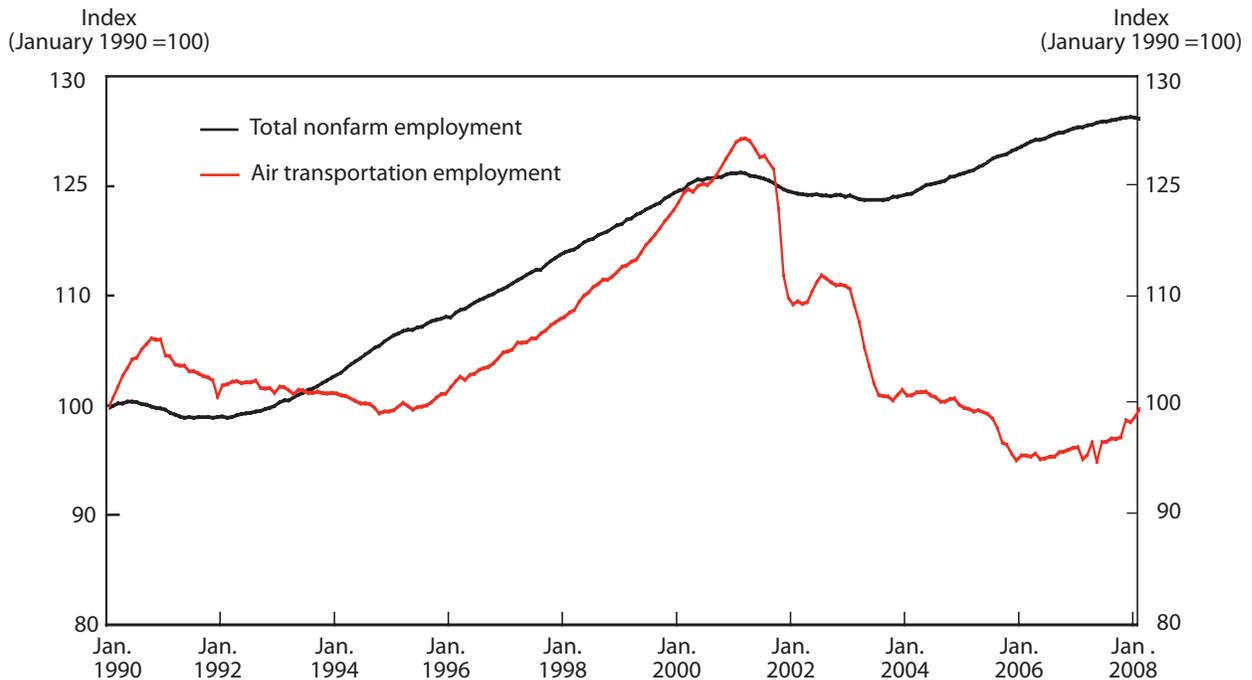
By the end of 2002, passenger volume began growing once again, helping the airlines to recover to some extent. However, in contrast to the late 1990s, growth in air travel did not translate into growth in airline employment. (See chart 5.) Despite a 24-percent rise in passenger volume from 2002 to 2005, employment in air transportation continued to fall, declining by 80,000;<sup>27</sup> the relationship between employment and passenger volume had apparently frayed. Had the relationship between volume and employment witnessed in the late 1990s continued, by 2006 employment in the industry would have been 47

percent higher than it actually was. (See chart 6.)<sup>28</sup>

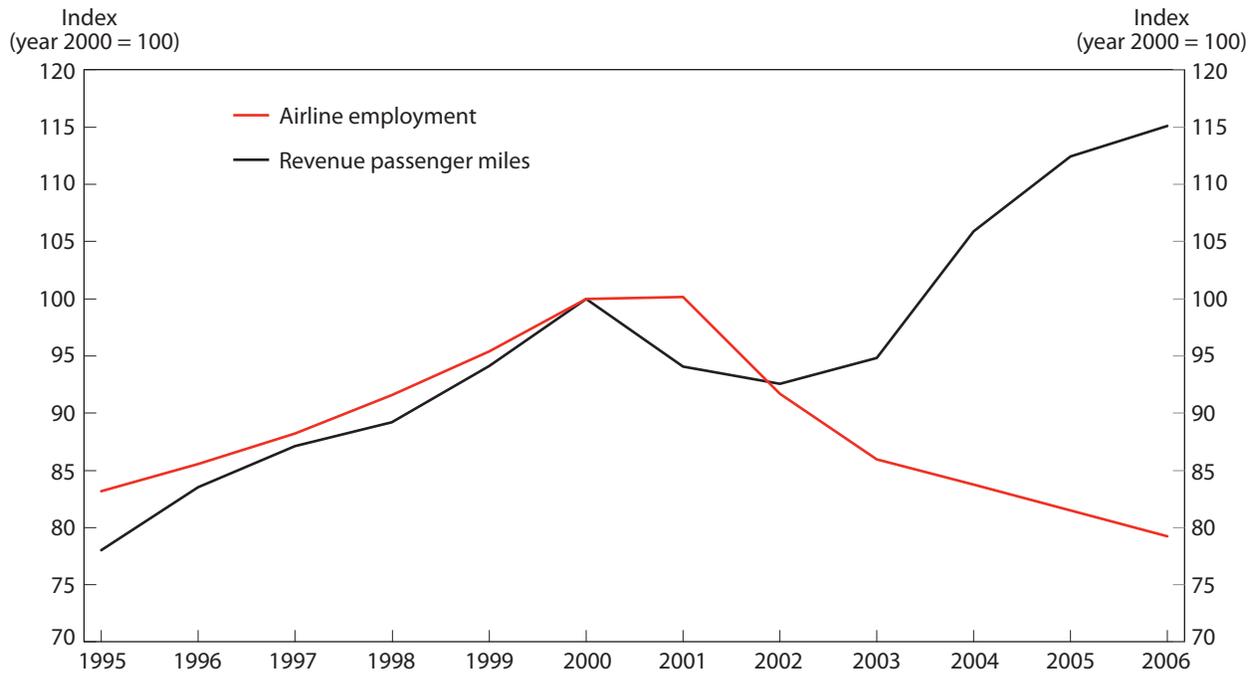
The disconnect between employment and volume was a product of the large financial losses the industry endured from 2002 until 2005. (See chart 7.) Unlike what happened in the late 1990s, increased passenger volume did not translate into an increase in profits during the 2002–05 period. The continued financial losses, despite rising volume, resulted from two main factors: a decline in airline ticket prices—resulting in less revenue per passenger—and rapidly rising fuel prices. The two forces converged to produce the largest financial losses in the history of the industry. From 2001 to 2005, the airline industry lost more than \$35 billion.<sup>29</sup> According to a Brookings Institution study, this translated into a loss of roughly \$13 per passenger.<sup>30</sup> The magnitude of the losses was so large that it exceeded all of the industry’s accumulated profits since 1947. By 2005, the airline industry’s cumulative losses since 1947 stood at \$17.2 billion. Virtually every major airline suffered financially during this period, and the industry experienced 22 bankruptcies from 2000 to 2004.<sup>31</sup>

Despite the recovery in passenger volume, airlines were again largely unsuccessful in their attempts to increase

**Chart 4. Indexes of total nonfarm employment and air transportation employment, seasonally adjusted, 1990–2008**



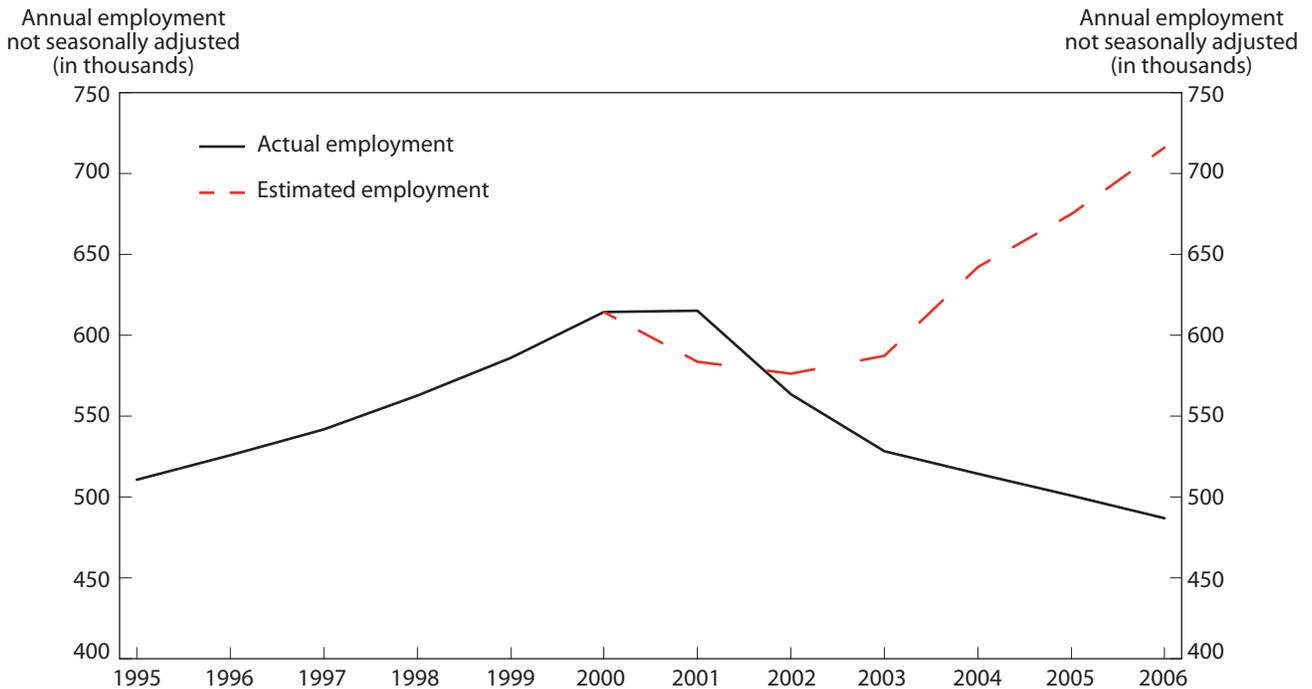
**Chart 5. Indexes of annual airline employment and revenue passenger miles, 1995–2006**



NOTE: Employment is based on nonseasonally adjusted annual averages.

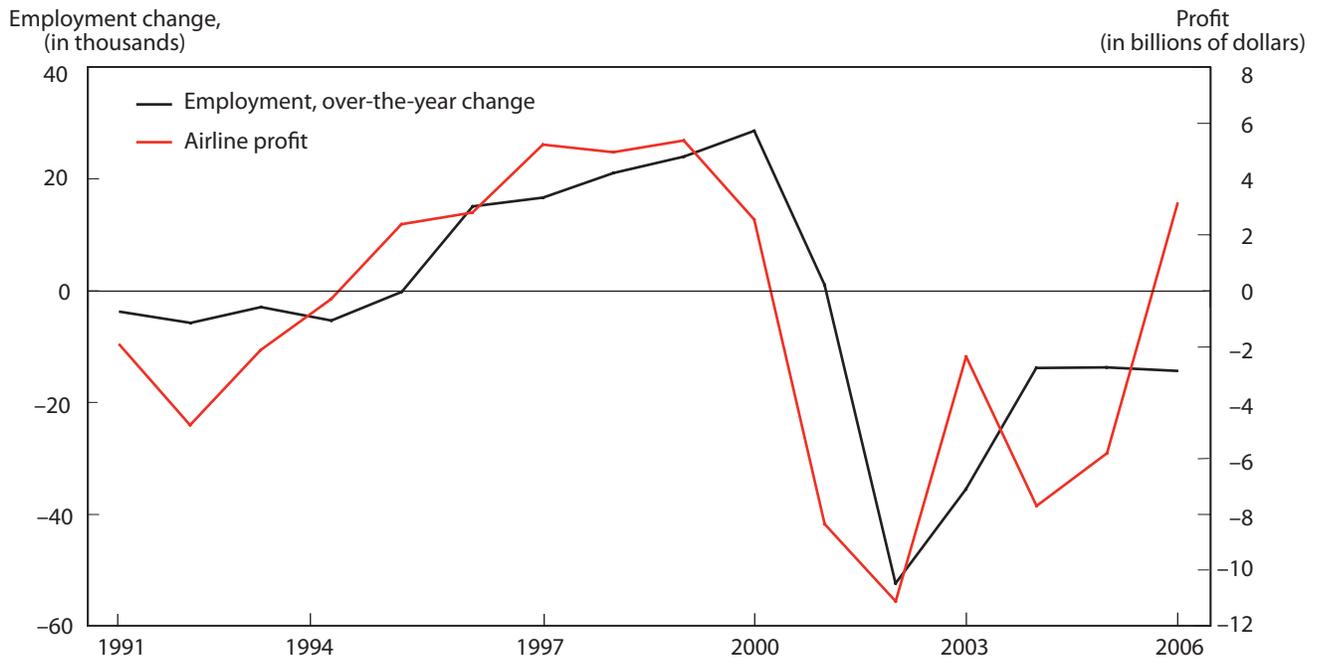
SOURCES: Air Transport Association and BLS Current Employment Statistics.

**Chart 6. Actual scheduled air transportation employment from 1995 to 2006, compared with employment figures estimated for the 2000–06 period**



NOTE: Estimated employment figures were calculated on the basis of the relationship between airline employment and revenue passenger miles between 1995 and 2000, using revenue passenger mile data from the 1995–2006 period.

SOURCES: Air Transport Association and BLS Current Employment Statistics.

**Chart 7. Air transportation employment over-the-year-change and airline profits, not seasonally adjusted, 1991–2006**

SOURCES: Air Transport Association and BLS Current Employment Statistics.

fares. Their failure has been attributed to the existence of overcapacity in the industry. An industry is generally believed to suffer from overcapacity when there is “an excess of capability to produce goods or provide a service over the level of demand.”<sup>32</sup> Much like the boom and subsequent busts seen in the telecommunications and information technology industries, airlines overestimated their ability to align capacity with future demand.<sup>33</sup> In 2001, total real fixed investment in air transportation was over 300 percent higher than in 1991, despite the industry’s gross output only growing by 41.9 percent.<sup>34</sup> The rapid expansion during the late 1990s left the industry with an abundance of air carriers. The high level of competition allowed consumers to shop around, thereby limiting the pricing power of airlines.

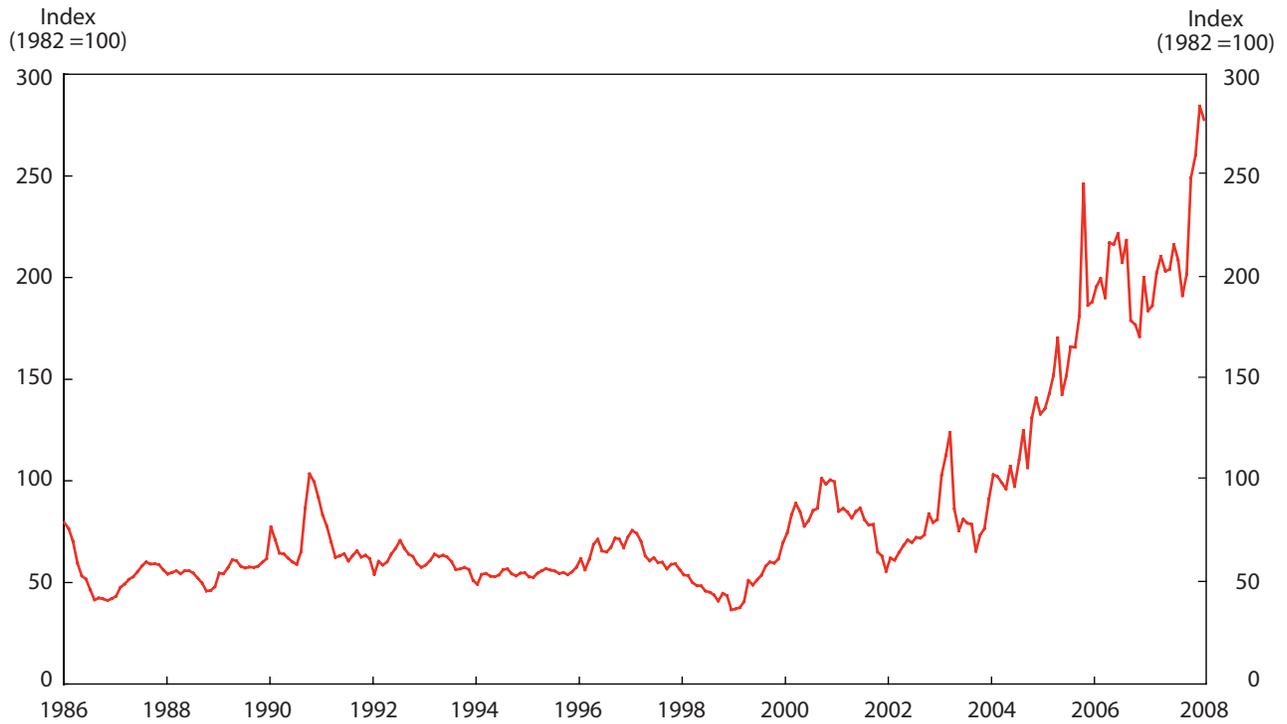
### The effect of high fuel prices

Rising fuel prices have compounded the airline industry’s troubles. Still struggling to recover from the downturn in air travel, airlines have found themselves facing not only tight competition, which limits their ability to raise revenues, but also surging fuel prices. From the relatively low price levels of the late 1990s, airline fuel, a major expense for airlines, has risen dramatically in price. By the middle

of 2006, the price of jet fuel had nearly tripled from its 2001 level. (See chart 8.)<sup>35</sup> As airlines were reducing labor costs, high fuel prices were forcing airlines to dramatically increase their fuel expenditures. By 2006, the cost of fuel had overtaken labor as the industry’s largest single expense, reversing the historical pattern.<sup>36</sup>

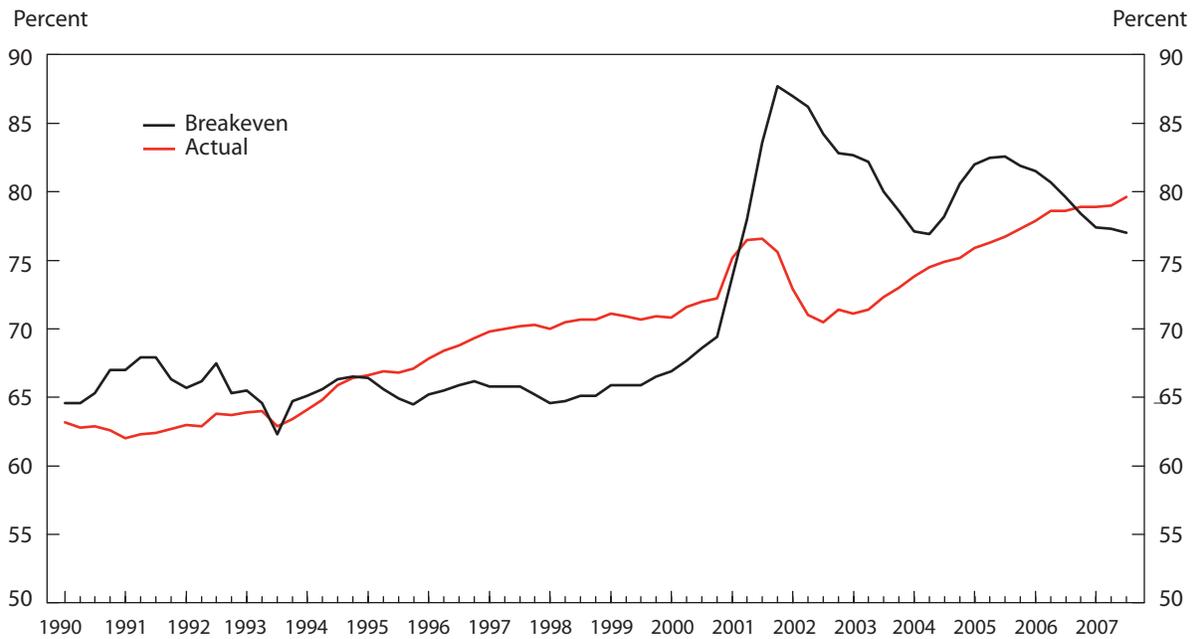
The rapid rise in the price of fuel radically altered the economics of air travel. Because of the rise in the cost of each flight and the stagnation in ticket prices, airlines had to increase the percent of seats they sold on each flight in order to break even. Estimates generated by the Air Transport Association indicate that in the late 1990s airlines needed a load factor of 65 percent to break even. (See chart 9.)<sup>37</sup> At the time the industry was averaging a load factor of around 70 percent, allowing airlines to profit despite excess capacity. However, from 2000 to 2002, rising fuel prices pushed the industry’s average breakeven point up 20 percentage points. Unable to boost their load factors, the airlines faced soaring losses. The gap between the breakeven load factor and the actual load factor reached its widest point in 2002 and then narrowed over the next 2 years as airlines streamlined operations and raised actual load factors to more than 75 percent. However, the narrowing proved to be short lived, because the rise in fuel prices continued unabated.

**Chart 8. Index of jet fuel prices, seasonally adjusted, 1986–2008**



SOURCE: Bureau of Labor Statistics Producer Price Index.

**Chart 9. U.S. passenger airline industry load factor, four-quarter moving average, 1990–2007**



SOURCE: Air Transport Association.

With airlines stymied in their attempts to raise prices to cover surging fuel expenditures, airlines continued to focus on cutting costs instead. As a result, airlines dropped unprofitable routes and attempted to reduce expenditures on their remaining routes. The industry also made strides toward reducing its fuel consumption. Many airlines have tried to reduce the weight of their airplanes and thereby raise fuel efficiency standards. Despite the industry's efforts to conserve fuel, fuel consumption can only be reduced so much, particularly in the short term.

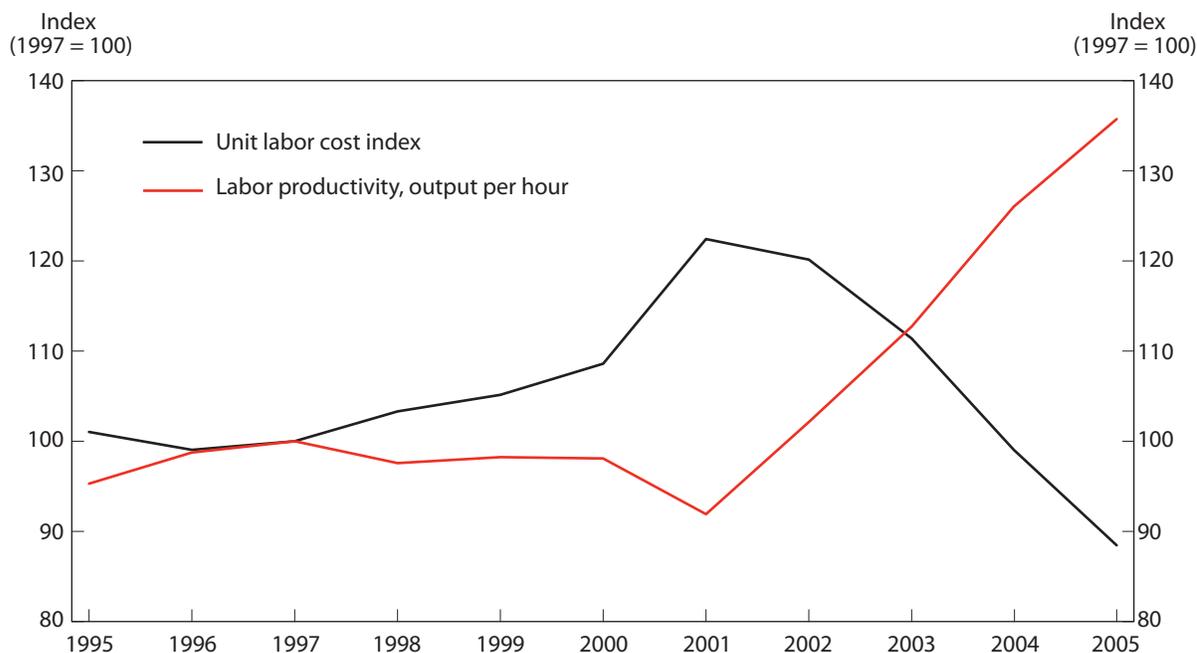
Because of their limited ability to curtail fuel expenses, airlines have had to look to other areas to reduce expenses. Labor, being a major portion of any airline's expense, has borne the brunt of these cost-saving efforts. Unlike jet fuel—a resource for which airlines have no alternative—capital is a resource that can sometimes be substituted for labor. Advances in information technology have made it possible to automate many previously labor-intensive processes. Functions such as reservations and passenger check-in can now be handled electronically. In addition, many airlines have made greater use of outsourcing to handle jobs such as routine maintenance. During the 4 years following 2001, the industry experienced a dramatic fall in unit labor costs as labor productivity rose by almost 50 percent. (See chart 10.)<sup>38</sup>

With the demand for labor in the airline industry decreasing, airlines have been able to reduce wages and increase work requirements. After 2001, efforts to reduce labor costs have been a major point of contention in airline contract negotiations. Recognizing the industry's fiscal situation, employees have generally been willing to accept pay cuts in exchange for continued employment. In addition to outright reductions in earnings, early retirement programs have also become commonplace across the industry. Because of turnover in the labor force, airlines have been able to replace experienced, higher-salaried employees with less experienced and thus less costly employees. Anecdotal reports indicate that the industry's starting salaries are lower than they were prior to 2001.<sup>39</sup> From 2001 to 2005, real weekly earnings in the industry fell by 8.3 percent. (See chart 11.)<sup>40</sup>

### Brief signs of a recovery

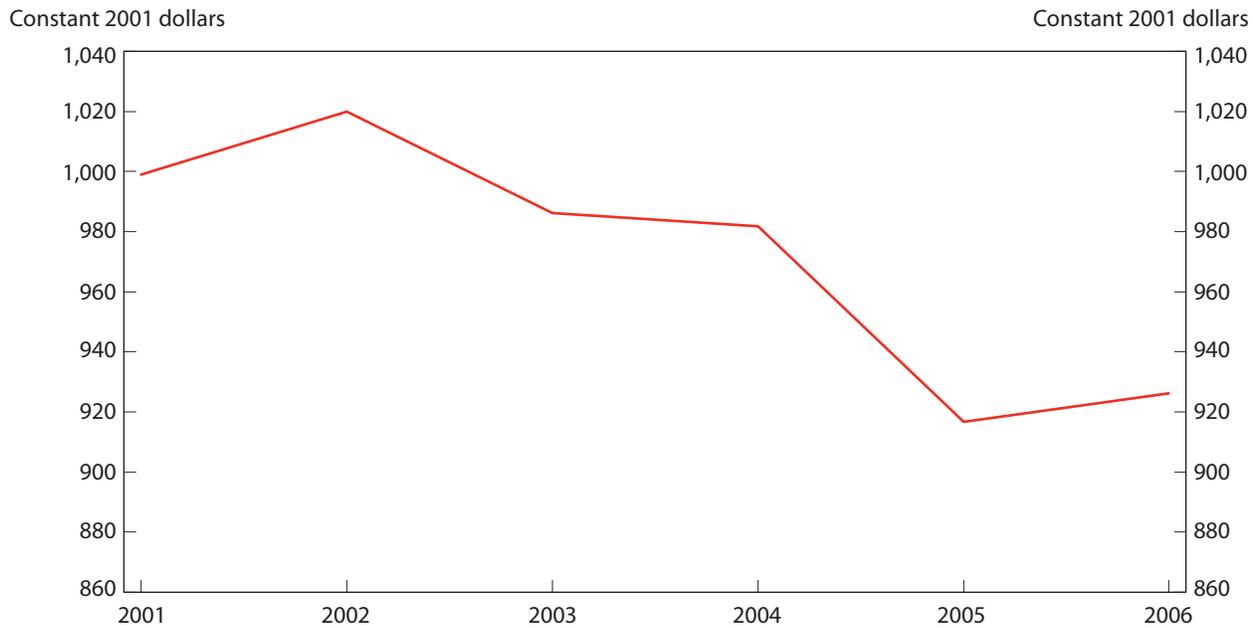
By 2006, airline industry employment began to show signs of recovering after several negative years. (See chart 12.) Passenger volumes stood at record levels, and the industry continued to make progress on structural reforms. Airlines were also successful in raising ticket prices for the first time in several years. Consequently, financial losses

**Chart 10. Air transportation, unit labor cost and labor productivity, output per hour, 1995–2005**



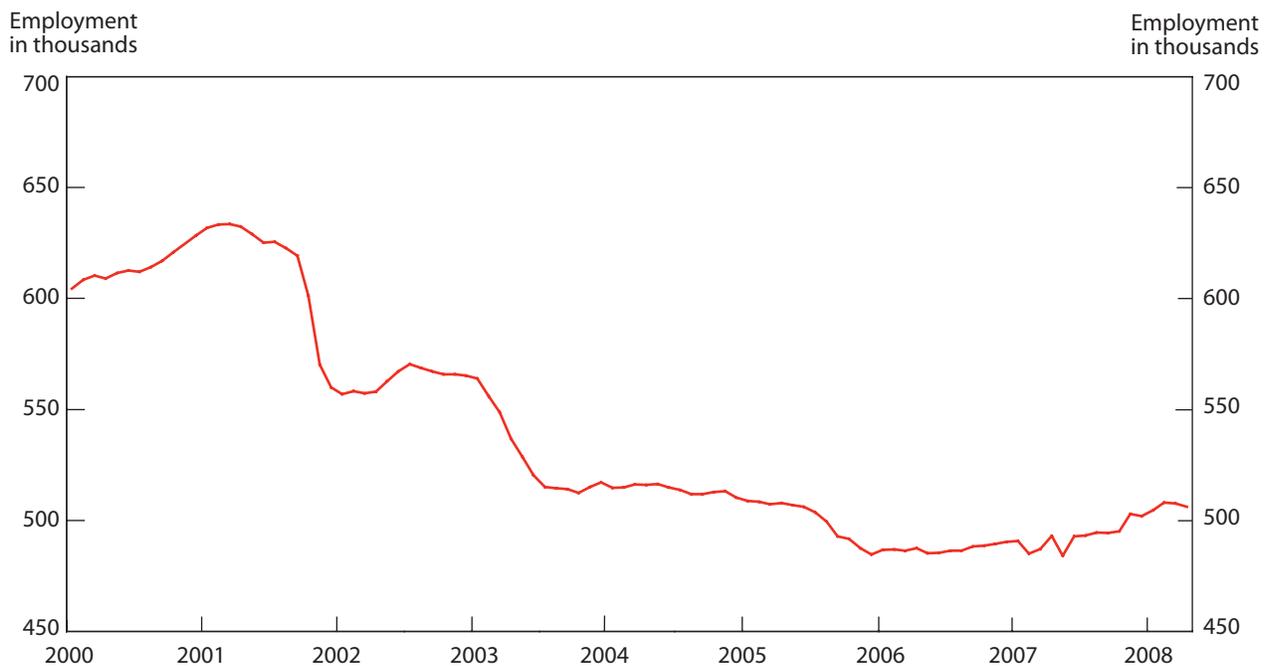
SOURCE: BLS Industry Productivity and Employment Cost Program.

**Chart 11. Average weekly wage in air transportation, 2001–06**



NOTE: Average weekly wages deflated by the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W).  
SOURCE: Bureau of Labor Statistics Quarterly Census of Employment and Wages.

**Chart 12. Air transportation employment, seasonally adjusted, 2000–08**



subsided, and many airlines recorded their first profits since 2000. Because of the gradually improving health of the airline industry, employment losses in the industry finally ended. After losing jobs for 5 of the 6 previous years, air transportation employment leveled off in early 2006. Airlines had completed most of their major layoffs yet remained hesitant to take on new personnel; accordingly, employment stagnated throughout the year. In February 2007, air transportation employment officially reached an employment trough. Although the airline industry had shed nearly one in four workers during the previous 6 years, the steady downward trend in air transportation employment had ended.

However, the respite did not last long. Despite modest employment growth in 2007, the industry once again experienced turbulence caused primarily by fuel prices that began to accelerate during the second half of 2007. By 2008, the industry's troubles were compounded by a slowing national economy. The anemic recovery in employment that had begun in early 2007 gave way to further job losses. In February 2008, the industry officially reached another employment peak after having recovered only a little over one-seventh of the jobs lost during the previous decline. By the middle of 2008, the industry had entered

another period of sustained employment declines because of a bleaker outlook for air travel resulting from rising fuel prices and a weakening economy.

THE AIRLINE INDUSTRY HAS RECENTLY EXPERIENCED its most volatile period in the past 20 years. Propelled by expectations of ever-increasing demand for air transportation, passenger airlines expanded rapidly throughout the late 1990s. The growth was led by discount carriers that possessed distinct competitive advantages over their more established rivals. When the economy faltered in 2001, it became apparent that air carriers had expanded beyond sustainable levels. The September 11th attacks contributed to a further decline in the industry. Over the course of the next 5 years, airlines continued to struggle as fuel prices rose to historic highs. Even after passenger volume recovered, the airlines continued to shed jobs in an attempt to restructure and return to profitability. In early 2007 employment in air transportation reached a trough, and airlines returned to profitability, carrying record numbers of passengers. However, the recovery in airline employment would prove to be short lived. By 2008, the industry was once again losing jobs because of soaring fuel prices and a faltering national economy. □

## Notes

<sup>1</sup> The data on employment used in this article are from the Current Employment Statistics (CES) program, which surveys 150,000 nonfarm businesses representing about 390,000 worksites monthly. For more information on the program's concepts and methodology, see Current Employment Statistics Technical Notes, on the BLS Web site at <http://www.bls.gov/ces/#technical> (visited Oct. 6, 2008). CES data are available at [www.bls.gov/ces](http://www.bls.gov/ces) (visited Oct. 7, 2008). Data used in this article are seasonally adjusted unless otherwise noted.

<sup>2</sup> As measured by revenue passenger miles, which is roughly the number of tickets sold times the average mile per ticket sold.

<sup>3</sup> Data in this article regarding airline employment refer to "air transportation" (NAICS 481), unless otherwise noted. The industry is composed of both "scheduled" and "nonscheduled" airline employment. However, scheduled air transportation accounts for the bulk of total air transportation employment.

<sup>4</sup> For complete projections on growth in air travel see "FAA Aerospace Forecasts Fiscal Years 2007–2020," on the Internet at [www.faa.gov/data\\_statistics/aviation/aerospace\\_forecasts/2007-2020-media/FORECAST%20BOOK%20SM.pdf](http://www.faa.gov/data_statistics/aviation/aerospace_forecasts/2007-2020-media/FORECAST%20BOOK%20SM.pdf) (visited Oct. 7, 2008).

<sup>5</sup> See "Outlook: Air Transport Market: The Demand Continues," *Avionics Magazine*, January 1, 2001, on the Internet at [www.aviation-today.com/av/categories/commercial/12513.html](http://www.aviation-today.com/av/categories/commercial/12513.html) (visited Oct. 7, 2008).

<sup>6</sup> See C.K. Anderson and J.G. Wilson, "Wait or buy? The strategic

consumer: Pricing and profit implications," *Journal of the Operational Research Society*, Mar. 1, 2003, pp. 299–306. It has been assumed that the Internet has allowed consumers and travel agents access to greater information on pricing than previously available. This study of consumer behavior found that prospective passengers were able to use "this information to make strategic purchasing decisions." This can result in "significantly reduced revenues [for firms] when buyers are using an informed strategic approach to purchasing."

<sup>7</sup> Data on profits and revenues are available from the Air Transport Association. The data are derived from the Bureau of Transportation Statistics' Schedule P-12 financial filing. Profit figures exclude accounting charges associated with bankruptcy restructuring. Operating expenses equal revenues minus operating profits. Operating income excludes expenditures on taxes, interest payments, and various one-time charges; as a result, operating profits differ from net income. Net income figures were used to determine profits and losses in this article. See [www.airlines.org/economics](http://www.airlines.org/economics) (visited Oct. 7, 2008).

<sup>8</sup> For a complete overview of airline employment trends in the 1990s, see William C. Goodman, "Transportation by air: job growth moderates," *Monthly Labor Review*, March 2000, pp. 34–47.

<sup>9</sup> Data on revenue passenger miles are provided by the Air Transport Association; the figures are based upon data produced by the U.S. Bureau of Transportation Statistics (BTS). According to the BTS, "[r]evenue passenger miles are computed by the summation of the products of the revenue aircraft miles flown on each inter-airport hop multiplied by the number of revenue passengers carried on that hop."

See [www.airlines.org/economics](http://www.airlines.org/economics) or <http://www.bts.gov/dictionary/list.xml?letter=R> (visited Oct. 7, 2008).

<sup>10</sup> Data on profits and revenues are available from the Air Transport Association. The data are derived from the Bureau of Transportation Statistics' Schedule P-12 financial filing. Profit figures exclude accounting charges associated with bankruptcy restructuring. See [www.airlines.org/economic](http://www.airlines.org/economic).

<sup>11</sup> See Lisa DiCarlo, "Jet Blue IPO Will Fly Right For Investors," *Forbes.com*, Feb. 12, 2002, on the Internet at [www.forbes.com/2002/02/12/0212jetblue.html](http://www.forbes.com/2002/02/12/0212jetblue.html) (visited Oct. 7, 2008).

<sup>12</sup> Tom Hansson, Jürgen Ringbeck, and Markus Franke, "Flight for Survival: A New Operating Model for Airlines," *strategy+business*, Dec. 6, 2002, on the Internet at [www.strategy-business.com/press/enews-article/22462](http://www.strategy-business.com/press/enews-article/22462) (visited Oct. 21, 2008).

<sup>13</sup> Barry T. Hirsch, "Wage Determination in the U.S. Airline Industry: Union Power under Product Market Constraints," Institute for the Study of Labor (IZA), October 2006.

<sup>14</sup> Real airfares are derived by dividing the nonseasonally adjusted CPI for All Urban Consumers U.S. city average for airline fares by the nonseasonally adjusted U.S. city average All items CPI for All Urban Consumers. The resulting data are smoothed with a 12-month moving average to remove short-term volatility. For additional information, please see: [www.bls.gov/cpi](http://www.bls.gov/cpi) (visited Oct. 7, 2008).

<sup>15</sup> Steven A. Morrison, "Actual, Adjacent, and Potential Competition: Estimating the Full Effects of Southwest Airlines," *Journal of Transport Economics and Policy*, May 2001, pp. 239-56.

<sup>16</sup> The definition of employment peak is based on official BLS employment peak and trough criteria. Employment in air transportation reached its highest point in March 2001.

<sup>17</sup> Data on available seat-miles are provided by the Air Transport Association; the figures are based upon data produced by the U.S. Bureau of Transportation Statistics. BTS defines available seat-miles as the miles flown in each inter-airport hop multiplied by the number of seats available on each respective hop for revenue passenger use. See [www.airlines.org/economics](http://www.airlines.org/economics) or [www.bts.gov](http://www.bts.gov).

<sup>18</sup> *U.S. Airline Cost Index 3rd Quarter 2005*, Air Transport Association, on the Internet at [www.airlines.org/economics/finance/Cost+Index.htm](http://www.airlines.org/economics/finance/Cost+Index.htm) (visited Oct. 21, 2008). The ATA defines "load factor" as: "the percentage of available seats that are filled with paying passengers, or of freight capacity that is utilized. Average load factor is computed as the ratio of RPMs to ASMs, or, in the case of cargo services, the ratio of RTMs to ATMs." (RTMs are revenue ton-miles, and ATMs are available ton-miles.) See [www.airlines.org/economics](http://www.airlines.org/economics).

<sup>19</sup> Gross domestic product (GDP) is produced by the Bureau of Economic Analysis. GDP figures are deflated by the BEA to account for inflation. See [www.bea.gov](http://www.bea.gov) (visited Oct. 7, 2008).

<sup>20</sup> Passenger volume is the sum of revenue passenger miles from all scheduled passenger carriers. The figures are provided by the Air Transport Association and are based upon data produced by the U.S. Bureau of Transportation Statistics. See [www.airlines.org/economics](http://www.airlines.org/economics) or [www.bts.gov](http://www.bts.gov).

<sup>21</sup> "Public Confident in Security of Airline Travel," Feb. 15, 2002, on the Internet at [www.gallup.com/poll/5335/Public-Confident-Security-Airline-Travel.aspx](http://www.gallup.com/poll/5335/Public-Confident-Security-Airline-Travel.aspx) (visited Oct. 21, 2008).

<sup>22</sup> The American Customer Satisfaction Index is produced by the National Quality Research Center at the University of Michigan's Ross School of Business. See [www.theacsi.org](http://www.theacsi.org) (visited Oct. 7, 2008).

<sup>23</sup> A mass layoff event is defined as a layoff of 50 or more workers at a particular establishment. See BLS Mass Layoff Statistics at [www.bls.gov/mls](http://www.bls.gov/mls) (visited Oct. 7, 2008).

<sup>24</sup> Data on profits and revenues are available from the Air Transport Association. The data are derived from the Bureau of Transportation Statistics' Schedule P-12 financial filing. Profit figures exclude accounting charges associated with bankruptcy restructuring. See [www.airlines.org/economics](http://www.airlines.org/economics).

<sup>25</sup> Kate Snow, Dana Bash, and Ted Barret, "Congress approves \$15 billion airline bailout," Sept. 24, 2001, on the Internet at <http://archives.cnn.com/2001/US/09/21/rec.congress.airline.deal/> (visited Oct. 7, 2008).

<sup>26</sup> Air travel, as measured by revenue passenger miles, also declined in 2 consecutive years: 1980 and 1981.

<sup>27</sup> The decline in employment is based on nonseasonally adjusted annual averages.

<sup>28</sup> The expected employment figure was derived from a linear regression model examining the relationship between annual revenue passenger mile data and the annual averages of nonseasonally-adjusted air transportation employment.

<sup>29</sup> Data on profits are from the Air Transport Association. Profits are equivalent to net income and are listed in current dollars. For more information, see [www.airlines.org/economics](http://www.airlines.org/economics).

<sup>30</sup> Steven Morrison and Clifford Winston, "What's Wrong with the Airline Industry?: Diagnosis and Possible Cures" (Washington, The Brookings Institution, 2005), Testimony before the U.S. House Subcommittee on Aviation, Sept. 28, 2005, on the Internet at [www.brookings.edu/~media/Files/rc/testimonies/2005/0928business\\_morrison/20050928winston.pdf](http://www.brookings.edu/~media/Files/rc/testimonies/2005/0928business_morrison/20050928winston.pdf) (visited Oct. 21, 2008).

<sup>31</sup> "Commercial Aviation: Bankruptcy and Pension Problems Are Symptoms of Underlying Structural Issues," Government Accountability Office, Sept. 30, 2005, on the Internet at [www.gao.gov/new.items/d05945.pdf](http://www.gao.gov/new.items/d05945.pdf) (visited Oct. 21, 2008).

<sup>32</sup> The definition of overcapacity is provided by the BNET Business Dictionary. See <http://dictionary.bnet.com/> (visited Oct. 21, 2008).

<sup>33</sup> Morrison and Winston, "What's Wrong with the Airline Industry?"

<sup>34</sup> Data on total real fixed investment and gross output in air transportation are produced by the Bureau of Economic Analysis. Fixed investment in air transportation measures the purchases of equipment and software by firms in the air transportation industry. Gross output consists of sales, or receipts, and other operating income, plus commodity taxes and changes in inventories. Both measures are adjusted to reflect the impact of inflation. See [www.bea.gov](http://www.bea.gov).

<sup>35</sup> Data on fuel prices are from the BLS Producer Prices Program. PPI commodity index WPU057203, a seasonally adjusted jet fuel index, is from the Producer Price Index's commodity data. Please see [www.bls.gov/ppi](http://www.bls.gov/ppi) (visited Oct. 7, 2008).

<sup>36</sup> *U.S. Airline Cost Index 3rd Quarter 2005*, Air Transport Association.

ciation, on the Internet at [www.airlines.org/economics/finance/Cost+Index.htm](http://www.airlines.org/economics/finance/Cost+Index.htm) (visited Oct. 21, 2008).

<sup>37</sup> Data on load factors and breakeven points are from the Air Transport Association's Quarterly Cost Index. This cost index is composed primarily "of data from quarterly financial and operational information collected by DOT (principally Form 41 reports.)" See [www.airlines.org](http://www.airlines.org) (visited Oct. 7, 2008).

<sup>38</sup> Data on productivity are produced by the BLS Industry Produc-

tivity and Cost program. See [www.bls.gov/Ipc](http://www.bls.gov/Ipc) (visited Oct. 7, 2008).

<sup>39</sup> Melanie Trottman and Susan Carey, "As Pay Falls, Airlines Struggle to Fill Jobs," *The Wall Street Journal*, May 16, 2007.

<sup>40</sup> Based on earnings data from the Quarterly Census of Employment and Wages, on the Internet at [www.bls.gov/qcew](http://www.bls.gov/qcew) (visited Oct. 7, 2008). Earnings are deflated with the Consumer Price Index for Urban Wage Earners and Clerical Workers to adjust for inflation. See [www.bls.gov/cpi](http://www.bls.gov/cpi) (visited Oct. 7, 2008).