Case 3 THE U.S. AIRLINE INDUSTRY IN 2002^{*}

Here's a list of 129 airlines that in the past 20 years filed for bankruptcy. Continental was smart enough to make that list twice. As of 1992, in fact--though the picture would have improved since then--the money that had been made since the dawn of aviation by all of this country's airline companies was zero. Absolutely zero.

Sizing all this up, I like to think that if I'd been at Kitty Hawk in 1903 when Orville Wright took off, I would have been farsighted enough, and public-spirited enough--I owed this to future capitalists--to shoot him down. I mean, Karl Marx couldn't have done as much damage to capitalists as Orville did.

---Warren Buffet, chairman,Berkshire Hathaway

For most of the first half of 2002, US airlines were still reeling from the aftermath of the terrorist attacks of September 11, 2001. Despite a recovery of passenger numbers and the US economy more generally, the industry's financial results for the first quarter of 2002 were dire. Compared to the first quarter of 2001, revenues were down by over 20 percent and a net profit of \$2 billion in 2000 was transformed into a loss of over \$7 billion for 2001. All the airlines battled to restor profitability through cost reductions and cutbacks in capacity. Although most airlines had reinstated some of their flights, the Mohave Desert looked much the same as in the dark days of the Persian Gulf war—it was a massive parking lot for unwanted jets. As a result of September 11, 350 passenger jets were retired or parked by US airlines.¹

While the focus of most airline executives was on survival in the short term, there were also longer run is sues that needed to be addressed. All the airlines were being courted by Airbus and Boeing for orders for the revolutionary new passenger jets that they were developing. Airbus had staked its future on the giant A380. A plane that would carry up to 560 passengers and would have, it hoped, a similar impact on mass air transportation as the Boeing 747 over 30 years earlier. At the same time, Boeing was realizing an alternative vision of the future of commercial air transport. In 2001, Boeing began developing its Sonic Cruiser, a high-speed, high-altitude jet designed to substantially reduce travel times on long distance flights.

Even if, as most airline executives expected, air traffic recovered from its recent setback and the US demand for airline travel was to achieve the long term growth trend of 4 percent per annum projected by the Federal Airline Administration (FAA), it was unclear whether market growth would translate into profits for the industry. If profitability in the US airline industry was going to be much the same in the future as it had been in the past, how could the companies justify capital investments in civil aviation if these investments were not going to yield a rate of return that covered their cost of capital?

	Revenue	Change on	Operating	Income	Net income	Net income
	Q1 2002	Q1, 2001	Q1 2002	Q1 2001	Q1 2002	Q1 2001
	\$, million		\$, million	\$, million	\$, million	\$, million
AMR	4.136	-13.1%	(729)	17	(575)	(45)
UAL	3.288	-25.7%	(629)	(319)	(510)	(313)
Delta	2.863	-28.7%	n.a.	n.a.	(354)	(133)
Northwest	2.180	-17.5%	n.a.	n.a.	(171)	(171)
Continental	1.993	-19.7%	(187)	76	(166)	9
US Airwavs Group	1.709	-23.7%	n.a.	n.a.	(269)	(171)
Southwest	1.257	-12.0%	49	210	21	121
TOTAL	17.426	-20.6%	n.a.	n.a.	(2024)	(703)

Table 3.1. Revenues and profits for the seven largest US airlines, first quarter 2002.

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	Available seat miles (billions)	Load factor (%)	Breakeven load factor (%)	Operating revenue (\$, billion)	Operating margin (%)	Rate of return on investment (%)
1978	369	61.5	57.4	22.9	5.2	13.3
1979	416	63.0	62.5	27.2	1.3	6.5.
1980	433	59.0	59.1	33.7	0.1	5.3.
1981	425	58.6	59.2	36.7	(0.8)	4.7.
1982	440	59.0	60.0	36.4	(2.5)	2.1.
1983	465	60.7	60.1	39.0	0.5	6.0.
1984	515	59.2	56.3	43.8	1.9	9.9.
1985	548	61.4	59.7	46.7	1.8	9.6.
1986	607	60.3	58.7	50.5	(0.5)	4.9.
1987	649	62.4	59.6	57.0	1.0	7.2.
1988	677	62.5	58.9	64.6	2.6	10.8
1989	684	63.2	61.6	69.3	0.2	6.3.
1990	733	62.4	64.0	76.1	(5.1)	(6.0)
1991	715	62.6	64.1	75.2	(2.6	(0.5)
1992	753	63.6	65.6	78.1	(3.1)	(9.3)
1993	771	63.5	62.4	83.8	1.7	(0.4)
1994	784	66.2	66.8	88.3	(0.4)	5.2
1995	807	67.0	64.9	94.6	2.4	11.9
1996	835	69.3	66.9	101.9	2.8	11.5
1997	861	70.3	65.0	109.6	4.7	14.7
1998	874	70.7	66.7	113.5	4.3	12.0
1999	918	71.0	66.4	119.0	4.5	11.1
2000	957	72.4	70.2	129.5	2.0	6.6
2001	923	71.3	77.0		(5.4)	

Table 3.2. Financial and operating data for the US airline industry, 1978-2000

FROM REGULATION TO COMPETITION

There have been two major phases in the development of the US airliner industry: the period of regulation up until 1978, and the period of deregulation since then.

The airlines under regulation (pre-1978)

The US civil airline industry began in the 1920s when scheduled services began primarily for carrying mail rather than passengers. As a result, the postmaster-general exercised regulatory control over the industry, and by the early 1930s, transcontinental routes were controlled by three airlines: United Airlines in the north, American airlines in the south, and TWA through the middle. New entry and growing competition (notably from Delta and Continental) led to the threat of instability in the industry, and in 1938 Congress responded with Civil Aeronautics Act. The legislation established the Civil Aeronautics Board (CAB) with authority to administer the structure of the industry and competition within it. The CAB awarded interstate routes to the existing 23 airlines, established safety guidelines priorities, and strict rules for passenger fares, airmail rates, route entry and exit, mergers and acquisitions, and interfirm agreements. Fares were set by CAB on the basis of cost plus a reasonable rate of return. The result was that cost increases could be passed on to customers. The outcome was an ossification of industry structure—despite more than 80 applications from firms seeking to operate scheduled domestic flights, not a single new carrier was approved between 19387 and 1978. Instead, new entrants set up as local carriers offering intrastate routes.

Rapid expansion of the industry after World War II and a wave of technological innovations—notably the jet—led to increasing concerns over airline safety. Following an aircraft collision in 1956 that killed 128 people, a new safety regulatory agency, the Federal Aviation Agency (later renamed the Federal Aviation Administration), was created in 1958.

During the 1970s, two factors created the impetus for reform. First, the oil shock of 1974 led to rapidly rising costs and attempts by the CAB to protect the airlines through large fare increases, a four-year moratorium on new routes, and agreements among the airlines to limit capacity on major routes. The result was the public's growing dissatisfaction with the high cost and inefficiency of air travel. Second, a major shift was occurring in political opinion. The system of airline regulation was an outcome of the New Deal. During the 1970s, the principles of economic liberalism were attracting increasing support. Politicians, particularly on the right were pushing for less reliance on government regulation and a greater role for market forces.

Political arguments for deregulation were supported by new developments in economics. The case for regulation had been based traditionally upon arguments about "natural monopoly"—competition was impossible in industries where scale economies and network effects were particularly important. During the early 1970s, the *theory of contestable markets* was developed. The main argument was that industries did not need to be competitively structured in order to result in competitive outcomes. So long as barriers to entry and exit were low, then the potential for "hit and run" entry would cause established firms to charge competitive prices and earn competitive rates of return.²

These arguments were supported by evidence that unregulated intrastate airfares were substantially lower than fares for interstate flights of comparable distances..

By the mid-1970s, pressures for regulatory reforms were gathering pace. In 1976, a Senate Subcommittee chaired by Ted Kennedy concluded that lifting government constraints on competition would cause efficiency and innovation in the airline industry to rise and prices to fall. In the same year, Alfred Kahn, the new chairman of the CAB, pushed the agency to liberalize entry and pricing. In October 1978 the Airline Deregulation Act abolishing the CAB was approved by Congress and signed into law by President Carter.

The impact of deregulation

The elimination of restrictions over domestic routes and schedules and over domestic fares resulted in a wave of new entrants—by 1980 20 new carriers including People Express, Air Florida, and Midway had set up—and an outbreak of price competition.

Deregulation was quickly followed by oil shock of 1979, the onset of world-wide recession, and the air traffic controllers' strike of 1981. During 1978-82, the industry incurred massive losses (see Table 3.2), the outcome was a widespread bankruptcy (between 1978 and 1988 over 150 carriers went bust) and a wave of mergers and acquisitions. By 1982, had resumed expansion and during the 1980s and into the 1990s mileage flown grew at a trend rate of 4 percent per annum. At the same time, competition and the quest for efficiency resulted in a continuous decline in real prices.

FIRM STRATEGY AND INDUSTRY EVOLUTION AFTER DEREGULATION

Changes in the structure of the airline industry during the 1980s and 1990s were primarily a result of the strategies of the airlines as they sought to adjust to the new conditions of competition in the industry and gain competitive advantage.

Route strategies: the hub and spoke system

During the 1980s a system of predominantly point-to-point routes was replaced by one where the major airlines concentrated their routes on a few major airports linked by frequent services using large aircraft, with smaller, nearby

airports connected to these hubs by shorted routes using smaller aircraft. This "hub-and-spoke" system offered two major benefits:

- ?? It allowed greater efficiency through concentrating traveler facilities and maintenance and refueling facilities in fewer locations, while permitting cost savings through higher levels of capacity utilization and the use of larger, more cost efficient aircraft for inter-hub travel. The efficiency benefits of the hub-and-spike system were reinforced by scheduling flights such that incoming short-haul arrivals were concentrated at particular times to allow passengers to be pooled for the longer-haul flights on large aircraft. The efficiency benefits of hub-and-spoke over point-to-point in terms of economizing on routes and aircraft distance traveled may illustrated by a hypothetical example. An airline with two hubs, each hub linking through 10 spokes to other cities can provide one-stop service with 21 routes. Non-stop, point-to-point service between all these cities would require 190 routes. In addition, the carrier can increase their overall load factor (and thus revenues) and flight frequencies and decrease costs by serving all these markets with fewer aircraft and fewer crewmembers.
- ?? It allowed major carriers to establish dominance in major regional markets and on particular routes. In effect, the major airlines became more geographically differentiated in their route offerings. The ability of a single airline to dominate individual hubs was reinforced by mergers. For example, when TWA acquired Ozark in 1986, it controller over 80 percent of flights in and out of St Louis. Northwest accounted for 65 percent of traffic in and out of Detroit Metropolitan Airport. The hub-and-spoke system also created a barrier to the entry of new carriers who often found it difficult to obtain gates and landing slots at the major hubs.

The hub and spoke system also allowed the major airlines to offer a more integrated, through-ticketing service by establishing alliances with local ("commuter") airlines. Thus, American Eagle, United Express, and Delta Shuttle were franchise systems established by AMR, UAL and Delta respectively whereby commuter airlines used the reservation and ticketing systems of the major airlines and coordinated their operations and marketing policies with those of their bigger partners.

Mergers

New entry during the period of deregulation had reduced seller concentration in the industry (see Table 3.3)

	4-firm concentration ratio		4-firm concentration ratio
1935	88%	1982	54.2%
1939	82%	1987	64.8%
1949	70%	1990	61.5%
1954	71%	1999	66.4%
1977	56.2%		

Table 3.3. Concentration in the US airline industry

Notes: The 4-firm concentration ratio measures the share of the industry's passenger-miles accounted for by the four largest companies. During 1935-54, the four biggest companies were United, American, TWA, and Eastern. During 1982-1999 the four biggest companies were United, American, Delta, and Northwest.

Source: Civil Aeronautics Board and US Dept. of Transport

The consolidation of the industry is shown in Figure 3.1.

Figure 3.1. Consolidation in the US airline industry after deregulation



Source: Updated from S. Borenstein, "The evolution of US airline competition," *Journal of Economic Perspectives*, Vol. 6, No. 2, 1992, p. 48.

Pricing

The growth of competition in the post-deregulation era was most apparent in the prices of air tickets. The instigators of lower prices were mainly established airlines suffering from weak revenues and excess capacity and eager for cash flow, and new entrants into the industry. The new, low-cost entrants played a critical role in stimulating the price wars that came to characterize competition after deregulation. People Express, Braniff, New York Air, and Southwest all sought aggressive expansion through rock bottom fares made possible by highly efficient cost structures and a bare-bones service (the low cost airlines typically offered no in-flight meals or entertainment and no baggage handling). Although most of the low-cost newcomers failed during the early years of airlines

In response to the price initiatives of the low-cost airlines, the major carriers sought to cut prices selectively. Fare structures became increasingly complex as airlines sought to separate price sensitive leisure customers from price inelastic business travelers. As a result, fare structures became wider: advanced purchased economy fares with Saturday night stays were often just 15 percent of the first class far for the same journey.

Price cuts were also selective by route. Typically the major airlines offered low prices on those routes where they faced competition from low-cost rivals. Southwest, the biggest and most successful of the economy carriers complained continually of predatory price cuts by its larger rivals.

However, the ability of the major airlines to compete against the budget airlines was limited by the majors cost structures. Their ability to reduce costs was constrained by their complex, restrictive labor agreements, their infrastructure, and their commitments to provide scheduled services over vast route networks. Hence, to meet the competition of low cost newcomers, several of the majors set up new subsidiaries to imitate the strategies and cost structures of the budget airlines. Continental launched CALite in 1994, and was followed the next year by UAL's "Shuttle by United." American Airlines, on the other hand, sought to compete with Southwest and other budget airlines (such as ValuJet) by forging agreements with smaller airlines such as Midway and Reno Air in which it ceded some its most price competitive (and loss making) routes to its smaller partners.

The quest for differentiation

Under regulation, the inability to compete on price resulted in airline competition shifting to non-price dimensions customer service and in-flight food and entertainment. Deregulation brutally exposed the myth of customer loyalty: most travelers could not distinguish major differences between the offerings of the different major airlines and were increasingly indifferent as to which airline they flew on a particular route. Increasing evidence that airline seats were fundamentally commodity products did not top the airlines from attempts to differentiate their offerings and build customer loyalty.

For the most part, efforts to attract customers through enhanced services and facilities were directed towards business travelers. The high margins on first and business class tickets provided a strong incentive to attract these customers by means of spacious seats and intensive in-flight pampering. For leisure travelers it was unclear whether their choice of carrier was responsive to anything other than price, and the low margins on these tickets limited the willingness of the

airlines to increase costs by providing additional services. Some airlines—notably TWA ad American—experimented with cabin configurations that offered coach passengers more legroom.

The most widespread and successful initiatives to build customer loyalty was the introduction of frequent flyer schemes. American's frequent flyer program was introduced in 1981 and was soon followed by all the other major airlines. By offering free tickets and upgrades on the basis of number of miles flown, and building in different threshold levels for receiving benefits, the airlines encourage customer loyalty and discourage customers from switching airlines in response to small price differentials. By the end of the 1990s, these frequent flyer programs had become a major part of the airlines operations. The *Economist* estimated that unredeemed frequent flyer miles had surged to 8 trillion miles by the end of 2001 worth roughly \$500 billion.³ Through involving other companies as partners—car rental companies, hotel chains, credit card issuers—frequent flyer programs had become an important source of additional revenue for the airlines worth about \$10 billion in 2001.⁴

THE INDUSTRY IN 2002

The airlines

At the end of 2001, the US airline industry comprised almost 100 companies ranging from the major airline to small local companies.

Major Airlines (13)	National Airlines (37)	Regional Airlines (46)
Alaska	Air Transport Int'l	Accessair
America West	Air Wisconsin	Air South
American	Air Tran	Allegiant
Continental	Aloha	AmeriJet
Delta	Atlantic Southeast	Ameristar
DHL Airways	Atlas Air	Asia Pacific Int'l
FedEx	Challenge	Capital Cargo
Northwest	Comair	Casino Express
Southwest	Continental Express	Champion Air
Trans World	Continental Micronesia	Custom Air
United	Emery Worldwide	Eastwind
United Parcel Services	Evergreen Int'l	Express National
US Airways	Executive	Falcon Air
	Express One	Florida West
	Fine	Gemini
	Frontier	Gulf and Caribbean
	Hawaiian	Kiwi
	Horizon Air	Laker
	JetBlue	Lorair
	Kitty Hawk	Lynden
	Mesaba	Miami Air
	Midway	Nations Air
	Midway Express	North American
	National	Northern Air
	Polar Air Cargo	Omni
	Ryan Int'l	Pace Aviation
	Spirit Air	Pan American
	Sun Country	Panagra
	Tower	Prestige
	Trans States	Pro Air
	USA Jet	Reeve Aleutian
	US Airways Shuttle	Reliant
	Vanguard	Renown
	World	Sierra Pacific
		Skytrek
		Southeast

Table 3.4. The US airline companies in 2001

Sun Pacific
Sunworld
Tatonduk
Trade Winds
Trans Air Link
Trans Continental
Transmeridian
UFS
Zantop

Source: Air Transport Association

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The industry was dominated by the seven major passenger airlines—United, American, Delta, Northwestern, Continental, US Airways, and Southwest.

	Available Seat Miles Sept. 2001 (billions)	Available Seat Miles Sept. 2000 (billions)	Load Factor Sept. 2001	Load factor Sept. 2000 (%)	Average cost per available seat mile
Carrier					
Total System	64.9	79.2	58.6	69.6	
United	11.4	14.5	61.2	69.9	67.5
American	10.0	12.9	59.7	70.0	65.0
Delta	10.1	12.3	56.6	68.9	82.5
Northwest	6.9	8.3	64.0	76.8	62.3
Continental	5.5	6.9	61.5	72.6	79.2
Southwest	4.9	5.0	52.5	65.7	61.3
US Airways	4.6	5.7	56.2	67.0	99.9
TWA	1.9	3.0	50.0	71.0	65.0
America West	1.9	2.2	59.7	64.0	66.6
Alaska	1.1	1.3	60.8	62.9	78.1
American Trans Air	0.9	1.0	64.7	72.2	66.6
American Eagle	0.4	0.4	44.3	56.4	201.4

A number of airlines are linked together in alliances. Thus, American, United, Delta, Northwest, and US Airways all have alliances with smaller airlines for coordination schedules and routs and using the reservations and ticketing systems of the larger carriers.

Given the mergers already in process (notably American's acquisition of TWA and United's attempt to acquire US Airways) and perilous financial state of many other airlines, most observers were expecting the industry's consolidation to continue into the future.

Market for air travel

At the beginning of the 21st century, airlines provided the dominant mode of long distance travel in the US. For shorter journeys, cars provided the major alternative. Alternative forms of public transportation—namely bus and rail— accounted for a small and diminishing proportion of journeys in excess of a hundred miles, except on a few routes (e.g. between Washington, New York, and Boston trains provided a viable alternative to air).

Most forecasts point dot the continued growth in the demand for air travel. Probably below the trend rate of 5 percent per year of past two decades, but most likely faster than the rate of population growth. There was little evidence of growing competition from alternative modes of transport. With Amtrak mired in financial and political difficulties, there seemed little chance that the US would develop high speed train services similar to those of Europe and Japan. Meanwhile, the communications revolution seemed to have done little to relieve business people of the need to face-to-face meeting.

More important changes were occurring within the structure of market demand. Of particular concern to the airlines was evidence that the segmentation between business and leisure customers was breaking down. Conventional wisdom dictated that while the demand for air tickets among leisure travels was fairly price elastic, that of business travelers was highly inelastic. As a result, while US ticket prices had declined by 8 percent in 2001, business class fares had increased. However, the huge premium of full-price coach and first class fares to advanced-purchased leisure fares was causing many employers to baulk. During 2001, the demand for first and business class travel declined sharply.⁵

Major changes were occurring within the distribution side of the industry. Historically, the primary channel of distribution of airline tickets was travel agencies: retailers that specialized in the sale of travel tickets, hotel reservations, and vacation packages and provided travel consulting and reservations services to travelers. During the 1990s, the airlines made substantial reductions in the commission rates paid to travel agents. By 1996, most airlines were paying a base commission rate of 8% on fares, with a \$50 cap on domestic round-trip fares. By 2000, the maximum commission rates offered by most airlines was 5 percent, while in 2001 Northwest led the way in withdrawing commissions from independent travel agents altogether. In the early 1990s commissions amounted to 10-11% of total costs, by 1998 they represented only about 6% of total costs. At the same time they developed their direct sales organizations using both telephone and internet reservations and ticket purchase systems. While the internet offered greater opportunity for airlines to deal directly with their customers, it also created a set of new players, on-line travel agents. Expedia, Travelocity, Cheap Tickets, Priceline, and a host of other on-line travel agents quickly established themselves as the biggest distributors of airline tickets in the US. Not only did their size allow them to wield greater bargaining power that traditional travel agencies, but they provided consumers with unparalleled transparency of prices permitting the lowest price deals to be quickly spotted. Meanwhile, in the traditional travel agent sector major changes were afoot as fragmentation gave way to consolidation (led my large international players such as American Express, Thomas Cook and Carlson). During 2001 and 2002, the airlines were attempting to gain greater control over ticket distribution. They offered their own on-line ticket agency, Orbitz, to compete with Expedia and Travelocity, while some of the budget airlines attempted to move towards complete direct selling. In 2002, Southwest withdrew its business from Travelocity and increased its proportion of ticket sales through its own online reservations system to 70%.

Airline cost conditions

Less than one-third of airline operating costs are accounted for by flying operations, servicing and maintenance account for a whopping 28 percent, while promotion and sales activities make up the next major cost activity (see Table 3.6).

	Percentage of total operating costs
Flying operations	31.0
Aircraft and traffic servicing	15.7
Maintenance	12.3
Promotion and sales	10.9
Transport related	10.3
Passenger services	8.6
Administrative	5.6
Depreciation and amortization	5.6

Table 3.6. The cost structure of the US airline industry: breakdown by activity

Source: Air Transport Association, 2000 Airline Industry Review.

Among the items which make up the airlines' total operating costs, labor costs are the most important, followed by fuel and equipment costs. Table 7 shows the breakdown of the industry's costs by cost item.

	Cost index	Cost index	% of total operating	% of total operating
	1991	2001	expenses 1991	expenses 2001
Labor cost	129	184	32.5	38.2
Fuel cost	89	78	14.5	12.0
Fleet cost	187	288	8.6	9.4
Interest cost	81	53	2.4	2.1
Insurance cost	81	68	0.3	0.5
Maintenance materials	183	180	3.4	2.7
Landing fees	153	202	1.9	1.9
Advertising and promotion	94	52	1.0	1.0
Traffic commission costs	188	65	10.4	3.4

Table 3.7. Airline costs by expense item, 1991 and 2001

Source: Air Traffic Association

Labor

Wages and salaries account for about 35% of total costs. The industry's labor costs are boosted by the high level of employee remuneration—average pay in airlines is 47% higher than the average for all private industries—and by low labor productivity that results from rigid working practices agreed with unions. Most airline workers belong to one of a dozen major unions: the Association of Flight Attendants, the Air Line Pilots Association, the International Association of Machinists and Aerospace Workers, etc. Labor unions provide the key institutional force through which high salaries have been maintained. Despite intense competition, falling real ticket prices, and the financial weakness of the industry, labor costs have continued to increase as airlines have awarded pay increases that far outstrip the rate of inflation. Labor relations in the industry have been historically adversarial with work stoppages and strike threats becoming increasingly frequent as contracts come up for reneal. United has typically set the lead in pay increases. In summer 2000, United pilots refused to work overtime, which resulted in delays and cancelled flights, which severely disrupted the summer travel plans of thousands of passengers. In order to solve the problem with its pilots, United agreed to extraordinary pay raises which led to parity demands among pilots at other airlines.

The Washington Post observed:

Before deregulation, the Civil Aeronautics Board governed fares and generally allowed airlines to pass along labor costs. That, together with the dread of work stoppages, disposed the carriers to generous labor contracts. In the 1990s, wages went up. Today the process is protracted, workers become angry, then surly with customers (remember United's pilots sabotaging their airline in 2000, when they had a miserable 40 percent on-time rate and 20,000 flights were canceled), so profits decline with service.

The industry could benefit from mandatory, binding arbitration of the sort baseball has. Each side would make a proposal and the arbitrator would pick one or the other proposal. Because the arbitrator could not split the difference, the process would pull each side toward the other.

Meanwhile, United pilots recently won a 28 percent raise, just before the company lost \$600 million in the *first* half of 2001. Other carriers' pilots want parity. Other workers want their earnings pulled up by those of the pilots. Turbulence ahead. Situation normal.⁶

Fuel

Jet fuel (kerosene) is the airlines' second largest cost accounting for 10 to 12% of total expenses. How much a carrier spends on fuel depends on the age of its aircraft and its average flight length. Newer planes and longer flights equate to higher fuel efficiency. Also, the fuel efficiency of different aircraft varies widely, primarily dependent on the number of engines. Fuel prices represent the most volatile and unpredictable cost item for the airlines due to fluctuations in the price of crude. Since January 1999 crude prices have fluctuated between \$14 and \$40 a barrel. Although there is strong competition between different refiners in the supply of petroleum products (including jet fuel), ultimately, fuel prices depend upon crude prices whose level is determined by the OPEC cartel. As OPEC has become increasingly effective in enforcing adherence to production quotas among its members, so the price of crude has remained high.

Equipment

Aircraft are the biggest capital expenditure item fort the airlines. At prices of up to \$150 million apiece (the A380 will be over \$200 million), the purchase of new planes represents a major source of financial strain for the airlines. While Boeing and Airbus compete fiercely for new business (especially when, as in the 2002, they have spare capacity), aggressive discounts and generous financing terms for the purchase of new planes disguises the fact that a major source of profits for the aircraft manufactures are in aftermarket sales of parts, upgrades, and training. Over the past 20 years the number of manufacturers of large jets has declined from four to two. Lockheed ceased civilian jet manufacture in 1984; McDonnell Douglas was acquired by Boeing in 1997.

Airport facilities

Airports play a critical role in the U.S. aviation industry. They are hugely complex, expensive facilities and few in number. Only the largest cities are served by more than one airport. Despite the rapid, sustained growth in air transport over the 25 years since deregulation, only one major new airport has been built—Denver. Most airports are owned by municipal or state governments and generate substantial revenue flows for these government authorities. Landing fees are set by contracts between the airport and the airlines, and are typically based upon aircraft weight. In 1993, Los Angeles International airport raised its landing fees by 200 percent, and increased them again by 33 percent in 1995. Threatened with the withdrawal of their landing rights, the airlines soon fell into line. Although the fees airlines pay to airports account for only about 5 percent of their total operating costs, airport landing fees and terminal rents have been one of the industry's fastest-growing costs. Between 1992 and 1999, airport charges including passenger facility charges rose 70 percent.⁷

Cost differences between airlines

One of the arguments for deregulation had been that there were few major economies of scale in air transport, hence large and small airlines could coexist. Indeed, there is little evidence that large airlines have systematically lower average costs than smaller airlines. However, there are economies associated with network density—the greater the number of routes within a region the easier is it for an airline to gain economies of utilization of aircraft, crews, and passenger and maintenance facilities. In practice, differences in average costs between airlines far exceeds those predicted by economies of scale, scope, density, or any other external factor. The critical issues seem to be company-specific managerial and organizational factors. The industry's cost leader, Southwest, has a strategy and management systems committed to lowering costs. By offering services from minor airports, with limited customer service, a single type of airplane, job-sharing among employees, and salary levels substantially less than those paid by other major carriers, Southwest achieves the industry's lowest cost per available seat mile (CASM) despite flying relatively short routes. Conversely, US Airways had the highest operating costs of the majors (its CASM in 2001 was 12.46 cents compared with 7.54 cents for Southwest and 10.14 cents for Delta and 11.14 for American). US Airways high costs were partly a result of eternal factors—short routes, smaller planes, and routes concentrated on the eastern seaboard and subject to adverse weather conditions—but mainly the consequence of managerial factors such as highly restrictive labor agreements, poor employee relations, and deficiencies in operational management.

A critical factor determining average costs was capacity utilization. Because most costs, al least in the short run, were fixed, profitable operation was acutely dependent upon achieving break-even levels of capacity operation. When airlines were operating below break even capacity there were big incentives to cut price in order to attract additional business. The industry's periodic price wars tended to occur during periods of slack demand and on routes where there were several competitors and considerable excess capacity.

Achieving high load factors while avoiding ruinously low prices is a major preoccupation for the airlines. Yield management systems are highly sophisticated computer models that combine historical data, models and rigorous financial analysis to provide flexible price determination. The goal is to earn as much revenue on each flight as possible. Achieving this goal, has meant a proliferation of pricing categories and a plethora of special deals ranging from "weekend internet specials" to the auctioning of tickets over internet auction sites such as EBay.

Entry and exit

Hopes by the deregulators that the US airline business would be a case study of competition in a contestable industry was thwarted by evidence of significant barriers to both entry and exit. Evidence on price levels showing significantly higher prices on routes with a single carrier suggested that potential competition was no substitute for actual competition. The key issue is that, while the capital costs of entry are fairly low (it is possible to set up a new airline with a single leased plane), offering airline service requires gates, airline and aircraft certification, takeoff and landing slots, baggage handling services, and the marketing and distribution of tickets. Airport congestion together with the increasing dominance of gates and landing slots at hub airports by a few major carriers has often meant that new entrants have been forced to use secondary airports. Despite the unprofitable state of the industry, there appeared to be a continual stream of entrepreneurs attracted to the apparent glamour of owning an airline. However, in the future the

most likely source of significant new entry was foreign airlines which in 2002 were still restricted from either acquiring US airlines or offering internal service within the US.

Once established, there are significant briers to the exit of companies from the industry. A notable feature of the industry has been the tendency for loss-making airlines to continue in the industry for long periods of time. The unwillingness or inability of airlines to exit can be attributed to the contracts (especially with employees) which give rise to large closure costs and optimism of executives and investors that things will get better in the future. A key factor maintaining otherwise insolvent airlines has been the provisions of Chapter 11 bankruptcy. The ability of financially failed airlines to enter Chapter 11 has allowed them to survive through suspending many of their contracts. A critical problem for otherwise financially healthy airlines has been meeting competition from bankrupt airlines which have the benefit of artificially lowered costs.

FUTURE PROSPECTS

Looking to the future, most of the major airlines looked to short run benefits from the recovery of the aviation market from the aftermath of September 11, but only limited prospects for longer run changes that might improve fundamental industry economics. The Air Transport Association's outlook statement offered little basis for optimism:

It is impossible to predict with certainty when air traffic demand will return to normal...Looking at the Gulf War as a point of reference, it took approximately six months for traffic to return to its previous levels. The declines following September 11 were dramatically deeper and the recovery is expected to reflect the changing world situation. Under normal circumstances the recovery would track the strengthening of US economy. However, because the events of September 11 and aftermath have no precedent, recovery remains less certain. A return to pre-September 11 levels of service sometime in the 3rd quarter of 2002 is the current expectation.

Unprecedented challenges for the airline industry lie ahead. Airlines must focus on cost control, cash preservation, and cautious growth. Losses are expected for the full year 2002, and it is not until 2003 that the airlines as a group see a hope of return to profitability. The net profit margin for airlines is slim, even at the best of times...Because cash from operations has declined significantly, many carriers will be forced to borrow...Debt will increase well above norms for other industries. Airline debt-to-capital ratios have risen to 60 percent as compared with 35 percent for US industry.⁸

Consultants at McKinsey & Company were even more pessimistic about the industry's outlook:

In times of low demand, airlines are badly hampered by high fixed costs. As an example, the newest Boeing or Airbus wide-body jetliners cost between \$80 million and \$150 million each, and lease or loan payments are due whether a plane is parked on a tarmac or cruising with a cabin full of paying passengers. Meanwhile, strong unions have historically made it difficult to reduce labor costs. From 1995 to 2000, operating costs for the US majors stayed roughly constant, with costs rising even higher in 2001 prior to September 11. After September 11, costs moved still higher to pay for increased security and insurance provisions (probably 1 to 2 percent of revenues)—and that is before adding the high cost of increased debt levels.

Cutting capacity is considered critical to cost reduction, but the full impact on profits still takes time to emerge. Analysts estimate that after September 11, airlines reduced the number of seats available for each kilometer they were flying by more than 20 percent in the United States. However, more than three-quarters of these reductions came from using active aircraft less, with the remaining cuts coming from putting aircraft into storage. Both measures allow airlines to lower variable costs, notably fuel and maintenance, by dropping unprofitable flights, but fixed costs such as lease and debt payments remain. What is more, because the excess capacity is readily available, it can come back quickly. In early 2002, airlines were already bringing back capacity into their networks rather than lose market share on key routes. This is particularly important, since available excess capacity in the present downturn exceeds that at similar points in the past two cycles.

As scheduled deliveries arrive during the next two years, the record surplus may continue growing despite the fact that the number of orders as a percentage of total fleet size is lower than it was at this point during the most recent cycle.

Another important element in recovery is passenger yield—the price paid for each passenger-kilometer flown. The problem here is that, given near-term fixed costs, airlines must sacrifice yield to keep seats filled. Business travel has been the primary source for high-yield passengers, critical to the economic viability of the hub-and-spoke model used by the major airlines. However, over the past several years, business travel has accounted for an ever smaller share of airline revenues. In 2001 before September 11, the share had dropped to 23 percent, from more than 35 percent in 1999, in the United States.

While some of this drop is normal cyclicality as companies cut back on travel, other factors indicate that the decline may be longer term. After September 11, the inconveniences caused by timeconsuming new security measures have made business travel even less attractive, and the likelihood is that these inconveniences will continue for the foreseeable future.

In order to reduce the cost of travel, companies have made several fundamental changes that are likely to have long-lasting effects on business travel revenues. Large corporations have used their purchasing power to negotiate volume discounts on fares, with price reductions on some routes often as high as 20 to 30 percent. Furthermore, most corporations are now enforcing the travel restrictions tied to these volume agreements.

Some alternatives to business travel on commercial airlines may now finally take hold. Companies are turning increasingly to travel substitutes such as videoconferencing and have been experimenting with shared corporate jets as a replacement for first-class travel for top executives. New advances such as Web conferencing have boosted demand for videoconferencing services, with a 30 percent year-overyear increase prior to September 11. Forced behavioral changes in the aftermath of the terrorist attacks have pushed the growth rate for these services up to 40 percent. In addition, the expansion of fractional jet models for business aircraft significantly increases the availability of business jets as a travel alternative. The corporate jet option, which is becoming more attractive given the increased time required to negotiate security procedures at major airports, may take away at least 10 percent of firstclass travelers by 2005. In view of these changes in the way corporations work and purchase travel, we believe that business travel revenues will remain under pressure even when the world economy recovers.

In the 1980s, increased yields drove recovery in the airline business. This time around, given the high levels of excess capacity and projected weakness in business travel revenues, we do not believe that yields will come back as strongly as in previous downturns. Instead, any recovery will have to come from long-term, structural cost reductions. For major airlines using the high-coverage hub-and-spoke model, such reductions may be difficult to achieve, and these airlines may struggle beyond 2004. In contrast, competitors that utilize a lower-cost strategy-such as Ryanair and easyJet in Europe, Southwest Airlines and WestJet in North America, and Virgin Blue in Australia—look well positioned to expand their operations and profitability.

Many industry experts believed that more fundamental changes in industry structure would be necessary to create a financially healthy airline industry in the US. The major airlines looked to consolidation as one means of reducing cutthroat competition and managing excess capacity in the system. With American's acquisition of TWA and United's proposed takeover of US Airways, industry concentration seemed likely to increase significantly. Other executives believed that the industry would always be unprofitable as long as it was subject to the power of organized labor. American's Don Carty believed that there was a case for Congressional intervention to mandate the arbitration of labor disputes in the industry.

NOTES

- ² For a review of contestability as applied to the airline industry, see S. Borenstein, "The evolution of US airline competition," *Journal of Economic Perspectives*, Vol. 6, No. 2, 1992, pp. 45-73. ³ "Fly me to the moon," *The Economist*, May 4, 2002, p. 80.

- ⁶ George Will "Always A Bumpy Ride," Washington Post, May 9, 2002, p. 34.
- ⁷ Air Transport Association, Airline Handbook, 2000
- ⁸ Air Transport Association, State of the US Airline Industry: A Report on Recent Trends for US Airline Carriers, 2002,
- pp. 9-11. (*http://www.airlines.org/public/industry/bin/state.pdf*)

¹ Air Transport Association, State of the US Airline Industry: A Report on Recent Trends for US Airline Carriers, 2002 (http://www.airlines.org/public/industry/bin/state.pdf)

⁴ Ibid.

⁵ "Saturday night fever," *The Economist*, April 20, 202, p. 72.