1

Overview and Trends

The Transportation Research Board (TRB) study committee that produced *Winds of Change* held its final meeting in the spring of 1991. The committee had reviewed the general experience of the U.S. airline industry during the more than a dozen years since legislation ended government economic regulation of entry, pricing, and ticket distribution in the domestic market.[1] The committee examined issues ranging from passenger fares and service in small communities to aviation safety and the federal government's performance in accommodating the escalating demands on air traffic control. At the time, it was still being debated whether airline deregulation was favorable to consumers. Once viewed as contrary to the public interest,[2] the vigorous airline competition

[1] The Airline Deregulation Act of 1978 was preceded by market-oriented administrative reforms adopted by the Civil Aeronautics Board (CAB) beginning in 1975.

[2] Congress adopted the public utility form of regulation for the airline industry when it created CAB, partly out of concern that the small scale of the industry and number of willing entrants would lead to excessive competition and capacity, ultimately having negative effects on service and perhaps leading to monopolies and having adverse effects on consumers in the end (Levine 1965; Meyer et al. 1959).

spurred by deregulation now is commonly credited with generating large and lasting public benefits. Since then, deregulation and related market-oriented reforms have spread to other transportation industries as well as to many international aviation markets.

The *Winds of Change* committee concluded that the removal of economic restrictions on airlines had benefited consumers, both generally and in most individual communities and city-pair markets. Average fares had fallen and flight frequencies had increased as most of the established airlines realigned and expanded their networks, becoming more innovative, cost conscious, and responsive to traveler demands than they had been when the government protected them from the rigors of competition. Yet the committee also identified several means to enhance competition. The specific steps recommended in *Winds of Change* are reprinted in Appendix B.

SCOPE AND ORGANIZATION OF THE REPORT

This report reviews the current state of competition in the airline industry and offers recommendations for increasing competition and opportunities for entry. Because *Winds of Change* presents a comprehensive review of the history and rationale for deregulation and its implications for passenger fares, productivity, and operations—as well as safety—no attempt is made here to review experience before 1990 or to reexamine the soundness of deregulation as public policy. While concurring with the favorable conclusions about deregulation that were reached in *Winds of Change* —as well as in many other studies[3]—the committee observes that opportunities remain for furthering competition, and little progress has been made in exploiting them.

More than most industries—and certainly more than any other transport mode—the airline industry is followed closely by the national media and policy makers; this close interest makes it difficult to take a prospective view of developments in the industry and to develop a more strategic

[3] See Morrison and Winston (1995) for a study of the airline industry since deregulation, including a listing of other studies.

approach to aviation policy. The committee therefore began by reviewing the major developments in commercial aviation during the past decade, including updated analyses of the passenger fares, competition, and market-entry trends presented in *Winds of Change.* These analyses are discussed in this first chapter, along with a description of the most recent wave of startup airlines.

In Chapter 2, the discussion turns to the specifics of airline competition. One longstanding and prominent issue is the ability of major airlines to dominate local passenger traffic at the hub airports where they concentrate their flights. Airlines typically carry a large share of local passengers in the city-pair routes from their main hubs. New carriers entering these markets with low-fare service have complained that incumbents respond by sharply lowering fares, expanding capacity, and employing other "exclusionary" tactics to drive out the challenger and inhibit further competition. These complaints—as well as the Department of Transportation's (DOT's) proposal to prohibit such anticompetitive conduct—are examined in Chapter 2.

Positive steps to expand and create market conditions conducive to more competition—and thus to limit the opportunities for airlines to obtain and exploit market power—is the emphasis in Chapter 3. The focus is on steps that would ensure sufficient airway and airport capacity, providing more opportunities for new entrants and allowing current carriers to expand their services competitively. The importance of freeing the flow of both capital and airline expertise into the industry and of ensuring an impartial ticket distribution system is also considered in Chapter 3.

The emergence of alliances and other partnerships among major airlines, both domestically and internationally, is reviewed in Chapter 4. These developments—ranging from partially-merged, frequent-flier programs to highly integrated partnerships sharing codes for flights—have become controversial because of their potential for furthering anticompetitive consolidation within the industry. Examined are the rationales for alliances and the assertions that these arrangements are incompatible with the goal of fostering competition.

In Chapter 5, the report concludes with additional suggestions and ideas that deserve further exploration as means to promote new airline services and entry in smaller markets.

GENERAL DEVELOPMENTS AND TRENDS DURING THE 1990s

The airline industry has evolved in many unanticipated ways during the past decade. Concern has fluctuated widely over the industry's financial and competitive situation. Early in the decade, its fragile financial condition was a central issue and the subject of policy proposals—mostly short-lived—to return the industry to profitability.[4] By mid-decade, alarm over weak profitability had faded, transforming instead into worries that some airlines had gained too much market power and were exploiting it by raising fares well above the cost of service. Although the industry's average fares declined during the 1990s, the widening of the range of fares became a more prominent issue. Fares varied greatly by market and even among individual travelers seated in the same row on the same flights.

The 1990s began with turmoil in the industry. Higher jet fuel prices and traveler fears of terrorism caused by Iraq's invasion of Kuwait combined with a global recession and sharply expanded industry capacity to increase operating costs, dampen travel demand, and reduce aircraft load factors. Concern over the competitive effects from the demise of two long-distressed airlines, Eastern and Pan American, developed into general alarm over the weakened financial condition of the industry as a whole. These anxieties were intensified as several debt-burdened airlines—Continental, TWA, and America West—filed for bankruptcy protection.

The recession and resulting industry operating losses from 1990 to 1992 spurred proposals to ease debt and cash-flow burdens—for instance, by allowing airlines to defer remittance of federal ticket-tax revenues (GAO 1991). As travel demand recovered and airlines began experimenting with higher fares, the emergence of new low-fare airlines gained notice. Many of these startup carriers used the equipment and labor shed by the large airlines during the recession and earlier failures. However, in 1996, the highly publicized crash of a ValuJet airliner damaged the reputation of low-fare carriers, contributing to the financial failure of some and discouraging startups generally.

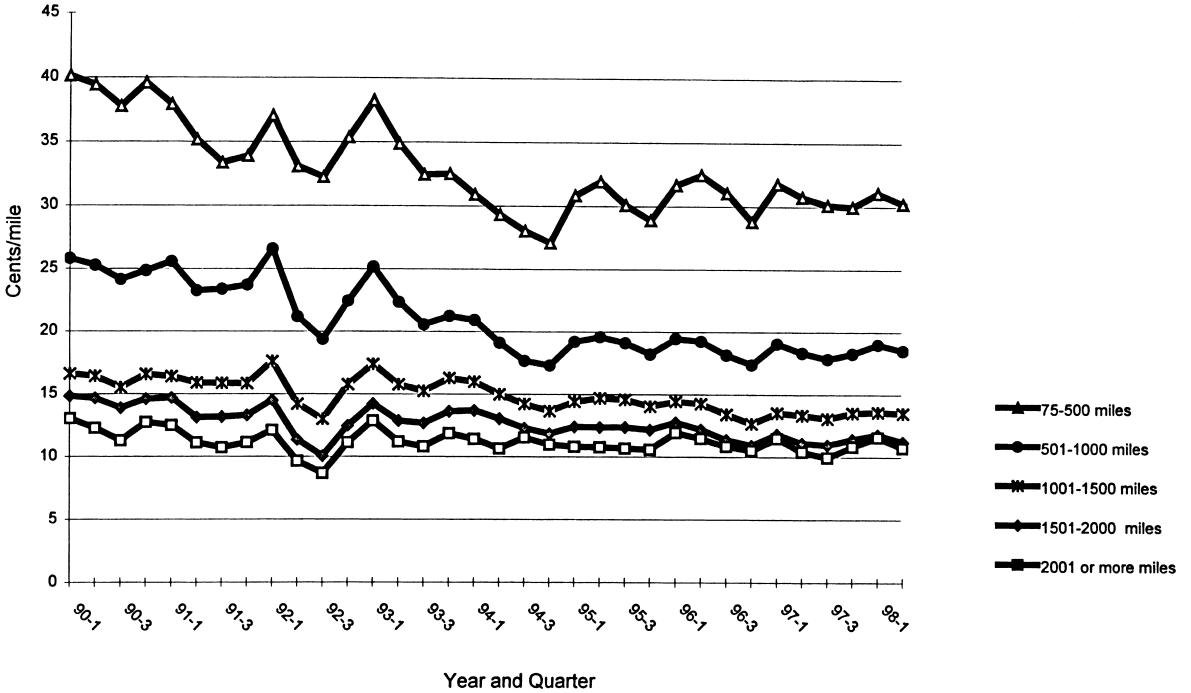
[4] For instance, see the 1993 report of the National Commission on Airline Competition.

Even before this, some startup airlines had complained about what they perceived as intentionally injurious, or predatory, tactics by incumbents. By the mid-1990s, alarm over the major airlines' financial condition was superseded by concern that financially strengthened incumbents were actively seeking the demise of startups and systematically suppressing competition. Meanwhile, public discontent with airline service and pricing practices, particularly over the higher fares charged to business passengers traveling on unrestricted tickets, was rising. Enjoying dramatic growth in travel demand, the airlines were increasingly viewed as disinterested in, and perhaps even disdainful of, their main customers.[5]

Whatever the merits of these concerns, consumers have continued to benefit overall from a deregulated industry, which still is characterized by significant price competition, including frequent fare wars that attract many bargain-seeking travelers. Adjusted for inflation, average fares decreased 25 percent from 1990 to 1998 (Figure 1-1). However, industry operating costs, as well as fares, have been largely stable since the middle of the decade, perhaps drifting slightly upward. Evident from the graph in Figure 1-1 is that most of the reductions in fares during the 1990s occurred early in the decade. Since 1995, trends have been relatively flat.

But how have these changes in average fares compared with changes in underlying production costs? One commonly used index of operating costs is DOT's Standard Industry Fare Level (SIFL), which depicts changes in airline operating costs per available seat-mile. Changes in the SIFL, as shown in Figure 1-2, suggest that much of the overall decline in average fares during the 1990s was caused by declining jet fuel costs. The trends also show, however, that there has not been a significant divergence—or a growing gap—in fare levels relative to costs, suggesting that the gains from deregulation have not eroded. Some of these cost reductions might be due to the competitive pressures ushered in by deregulation, supplying further evidence of the policy's continuing benefits.

[5] See Murray, M. Airfares: Fare or Foul? *National Journal*, April 4, 1999, pp. 950–954.



NOTE: Average yield per passenger trip (average fare/miles flown) was calculated using the DOT 10 percent ticket sample accessed through Database Products. Figures were adjusted using the gross domestic product (GDP) price deflator. Trips with zero fares were excluded.
(1 mile = 1.61 kilometers)

Figure 1-1 Average yield for domestic air travel by mileage block, 1990 to 1998 (2nd quarter).

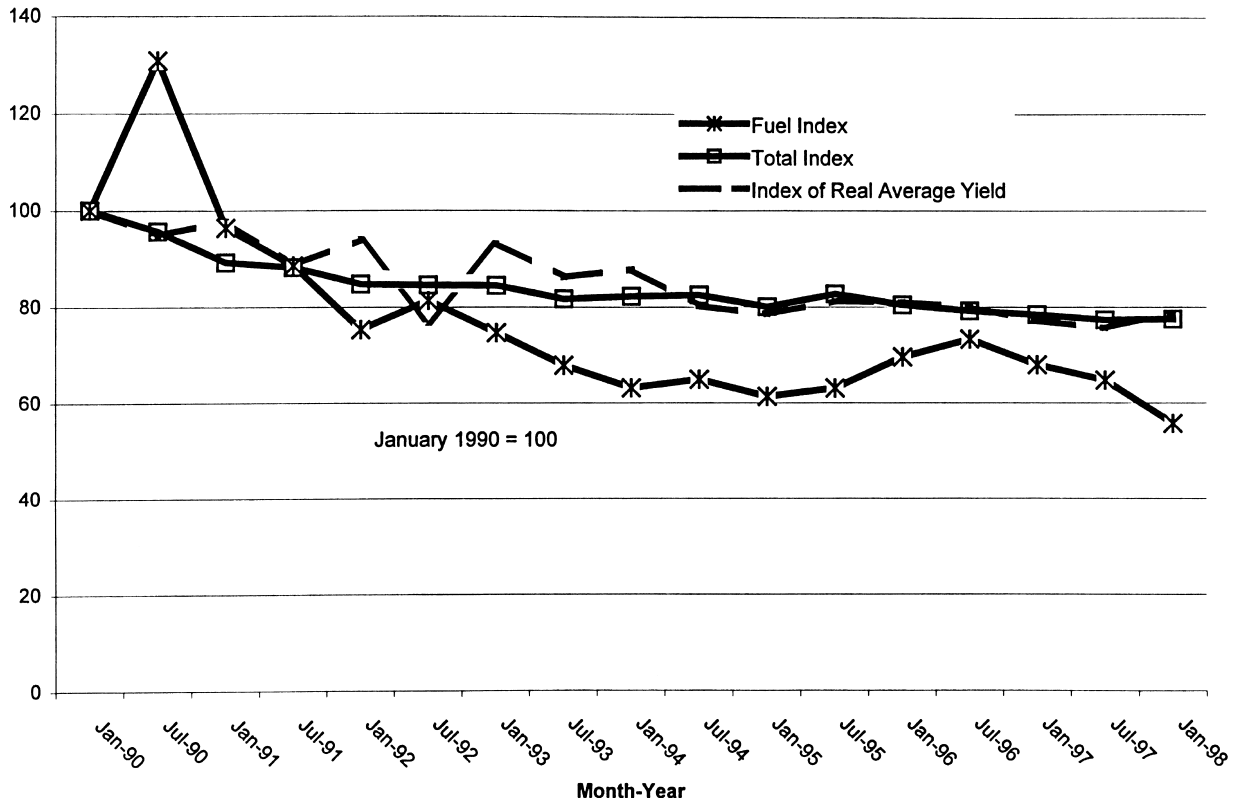


Figure 1-2 Trends in Standard Industry Fare Level (SIFL) Index, 1990 to 1998.

As the decade of the 1990s progressed, airlines refined their ability to charge different fares to different groups of travelers: this evidently widened the spread in fares paid. Unable to take advantage of the heavily restricted low-price tickets, time-sensitive business travelers have increasingly expressed concern that the fares they are being charged are far above the cost of providing the service in an efficient manner.

In this report, as in most other studies, reference often is made to "average fares," and average fare data are used in many of the data analyses. As discussed in the next section, however, the airlines serve two distinct types of customers—business travelers and leisure travelers. Airlines have become skilled at distinguishing these passengers and charging them widely differing fares by imposing purchase restrictions. Thus, in addition to average fares, the actual fares paid, sorted by restriction type, would be helpful in examining trends. However, it is unclear how such data could be gathered and analyzed. "Restricted" or "discounted" fares are terms that cannot be defined easily or uniformly. In an industry in which buyers are paying widely differing prices—and not necessarily for the same product—market averages are imperfect but still remain the most informative and reliable price measure available.

PRICE DISPERSION IN THE AIRLINE INDUSTRY

Fare dispersion has grown since deregulation, continuing into the past decade. In this section, trends in fare dispersion in the airline industry and their possible causes are discussed.

There are two general reasons why buyers in any industry properly might be charged different prices for products that appear to be the same or nearly the same—these reasons are both efficiency- and welfare-enhancing. The first reason is that there is a difference in the direct costs of supplying the products to different groups of customers—such as the cost of delivering the product to the point of sale. The second reason is that there are significant economies of scale and scope in the products' supply, even though the products and the costs of supplying them are effectively the same. When a firm sells the same or almost identical products at different prices to different buyers, or at different markups to the marginal cost, price discrimination has occurred.

In this circumstance, prices set uniformly at their marginal costs would not recover the total costs of supplying the products, including fixed and overhead expenses; and it then becomes necessary to charge buyers prices in excess of incremental cost, if the products are to continue to be supplied without external subsidy. In this situation, the seller can take advantage of buyers attaching widely different values to the same product, if the seller can sort the buyers on the basis of their different product valuations. The seller then can charge prices that are above marginal cost to buyers who are least sensitive to price. This allows the seller to generate sufficient revenue to provide the product, but no more than that if competition is effective. A more general discussion of price differentiation is provided in the accompanying sidebar (Box 1-1).

As discussed in Chapter 2, the major airlines maintain that fare differentials—that is, variations in fares between business and leisure travelers—are caused by direct differences in cost, such as those associated with flying during peak or congested periods. Unfortunately, the airlines have offered little empirical evidence to support this explanation, perhaps because many shared costs make cost allocations among classes of service highly arbitrary. Evidence of growing fare dispersion also has not been accompanied by evidence of growing cost dispersion. Nevertheless, a substantial portion of the fare differences is explicable in terms of the direct costs of the two kinds of services. Certainly, the economies gained from a route's density—for example, denser routes permit larger planes, with correspondingly lower costs per seat mile—suggest that fares typically will be lower in dense markets than in thin markets. Differing constraints on airport and airway capacity, including terminal charges, also can contribute to differences in costs, and therefore to variations in fares across markets. Likewise, fares paid by travelers in the same markets can vary widely because of differences in the cost of traveling at different times of the day and week. For instance, higher fares should be expected for travel during peak times when demand is greatest and resources are tight (Gale and Holmes 1993; Borenstein and Rose 1994). Travelers booking early are less costly to serve than travelers booking much later, because holding unsold seats in anticipation of late-booking travelers increases the risk that the seats will fly empty. Business travelers pay higher fares in part because they tend to be late bookers; however, leisure travelers, who pay the lowest fares, tend to be early bookers. When demand

Box 1-1

▼

Ramsey Pricing

Economists generally maintain that prices set equal to the marginal costs of producing goods or services are optimal—that is, they are "welfare maximizing." However, problems can arise if the marginal costs are less than the average costs for the producer at levels of output that would prevail if prices were set uniformly for all buyers. In this situation, the revenue from marginal cost pricing would not cover the total costs and the producer would not be able to continue to provide the product—the product would not pay enough to replace equipment and other capital in the long term. The loss of the product in turn can create welfare losses, particularly for consumers who have valued it highly.

A well-known theorem in economics, known as Ramsey pricing, after one of its earliest proponents, holds that the welfare losses created by deviating from marginal cost pricing are minimized if buyers with inelastic demands are charged the highest prices or markups above the marginal cost. In this way, the overhead, fixed, and other costs—which make up total costs but are otherwise excluded from marginal cost—can be included in the prices charged to buyers with inelastic demand. This minimizes the deviation in consumption patterns from what would have occurred if prices were set uniformly at the marginal cost.

The airline industry's pricing practices are similar to Ramsey pricing. Leisure travelers who are sensitive to price (i.e., are price-elastic) are charged fares roughly equal to the marginal cost of serving them; but in the aggregate these are insufficient to cover the full cost of maintaining the airline networks. U.S. airlines, competing for capital in private financial markets, must cover their total costs. As Ramsey would suggest, the airlines can cover any shortfall in revenues from leisure trav-

Box 1-1 *continued*

elers by charging higher prices—or whatever the traffic will bear—to price-inelastic, business travelers. In this way, the airlines are able to finance a more extensive network than would have been possible otherwise.

Of course, customers who make the extra contributions are seldom content with this role. Some business travelers believe they are being held captive to their inelastic demands because of anticompetitive actions taken by the airlines, such as holding back new entrants or new technologies—for example, smaller, regional jets. A traditional role of economic regulation, particularly in telecommunications and transportation, has been to smooth out the surcharges by making them uniform over broad classes of customers, and therefore more politically acceptable. However this is usually achieved with some sacrifice in welfare, by decreasing the markups to the most inelastic buyers while increasing them for buyers who are more sensitive to price. The politically acceptable solution usually has led to consumption patterns with greater deviation from the marginal cost optimum than would occur under a strict Ramsey solution.

Although Ramsey pricing can be beneficial in the short term, it might be less desirable in the long term. The Ramsey optimum is static. Unless prices adjust quickly or producers have considerable foresight, the Ramsey optimum can be undermined by any changes in the demand elasticities and other conditions that define it. Moreover, Ramsey pricing creates its own strong incentives for change. Buyers paying the highest prices, or markups, have incentives to seek alternatives to the high-priced service. Over time, they will find alternatives, or make adjustments to their circumstances to rely less on the product; this would make much of the existing capacity redundant for some period of time or until the industry can adjust capacity properly.

New technology and other changes and alternatives—including new competitors—that undermine an established Ram-

continued

Box 1-1 *continued*

sey pricing pattern are not welcome to the incumbent producers. In the long term, sustaining such a pricing scheme usually requires government regulation or monopoly power to bar entry. Producers who price under a Ramsey scheme are likely to be hostile to change, even if the change is beneficial to consumers. Some of the most counterproductive experiences with industry economic regulation were attempts to maintain discriminatory pricing by delaying technological changes that otherwise were desirable (Gellman 1971). Price discrimination therefore should be allowed only if it is tested by open entry and competition, as recommended in this report.

for seats is high, the cost of holding an empty seat in anticipation of late-booking or "walk-up" travelers—that is, the opportunity cost if the seat is not sold—can be high. This cost in turn can be reflected in higher fares for travelers who book late or who make last-minute itinerary changes.

Although much of the observed spread in airline fares can be explained by observable cost differences, not all can, and certainly some of the spread seems to be the result of price discrimination. Airlines have long been able to sort travelers according to their relative price elasticities by imposing various ticket restrictions. The types of restrictions are discussed in more detail below; the main point is that the general ability of airlines to price-discriminate may be advantageous to travelers, at least in the short run. The argument that some price discrimination in the airline industry can be desirable rests on the recognition that the product demanded by schedule-sensitive business travelers differs significantly from the product demanded by price-sensitive leisure travelers. The difference in preferences between the two kinds of travelers may be the greatest on short-haul flights. In these markets, leisure travelers would be expected to be sensitive to price because driving is a travel option. Meanwhile, flight frequency may be especially important to business travelers, since saving relatively small amounts of time is a main reason

for the decision to fly rather than drive. By being able to identify leisure travelers through ticket restrictions, the price-discriminating airline can offer discounted fares to fill unsold seats on flights that might otherwise fly partially empty; at the same time, it does not permit business travelers to take advantage of these lower fares.

Without the ability to restrict access to these low-fare tickets by time-sensitive business travelers, the airline might not be able to cover the total cost of providing frequent and extensive service. For example, at a hub, airline operations realize large economies of scale and scope, lowering average costs; moreover, the number of routes that can be served increases disproportionately with an increase in the number of scheduled flights. It is possible that hub fares set uniformly at marginal cost would generate revenue insufficient to recover total costs, necessitating discriminatory pricing if the hub airline wants to maintain its service. Price discrimination allows carriers to cover both the operating and capital costs of providing the schedule-intensive service desired by business travelers, while filling empty seats with leisure travelers whose low fares at least cover their incremental, or marginal, cost.

However, the possibility that airlines have become too skilled at identifying price-inelastic travelers and too eager to charge them excessive fares—above the level necessary to efficiently provide the service—has become an issue. One indicator of this would be that the price-discriminating airline is reaping monopoly profits—that is, excessive returns on capital. But this is difficult to determine, because it involves projections of airline profits and the effects of the business cycle. A protection against this kind of exploitation is free entry. If entry is not artificially impeded, competing services will ensure that the fares charged to price-inelastic travelers reflect, in the long run, the full or stand-alone cost of efficiently providing the service desired.

As some uniformly low-fare carriers, such as Southwest Airlines, have discovered, business travelers are not completely insensitive to price and are sometimes willing to accept fewer schedule options in return for substantial fare reductions. In those dense markets in which airlines are charging excessive fares to price-inelastic travelers, it is precisely this kind of nonnetwork, point-to-point, low-fare entry that might be most expected, especially given the high overhead and fixed

costs associated with creating a brand new, competing hub-and-spoke system. As noted later in this chapter, however, new low-fare service has tended to focus on dense markets only, where point-to-point service can be economical; service coverage in many thinner markets—often important to business travelers—remains the domain of the larger carriers with their larger and higher-fixed-cost networks. The introduction of smaller regional jets and other new technologies might change this situation, as noted later.

Fare Restrictions as Means of Differential Pricing

In their formative years, regulated airlines concentrated on business travelers. Unscheduled charter service was permitted for some low-fare travel (e.g., tour packages), but in general the price-sensitive, leisure travel market was neglected (Douglas and Miller 1974; Meyer and Oster 1984, 3). But by the mid-1960s, regulated airlines were increasing their use of discount coach fares to attract more leisure passengers to fill seats on their new larger-capacity jet aircraft. Senior citizens, students, and family of travelers flying on full fares were offered discounts of up to 25 percent. Using such differential methods of pricing, airlines could identify and attract price-sensitive traffic without marking down the fares charged to regular business travelers. The airlines maintained—and the CAB regulators presumed—that such discriminatory pricing was needed to ensure the long-run profitability of the service. Though seldom able to purchase the discounted fares, business travelers were thought to have benefited because more frequent flights were available in larger aircraft.

Some economists predicted that deregulation would diminish airlines' ability to differentiate among types of travelers, because of a general belief that monopoly power (or regulatory protection) was required for discrimination and a lack of understanding of the economies of scale and scope that would come to characterize a post-deregulation industry. According to this view, new and incumbent airlines would tailor their services to particular kinds of travelers. For example, single-class, service-intensive airlines would cater to business travelers by providing more spacious seating, frequent departure times, and generous in-flight amenities, but charging uniformly high fares to cover the cost of this premium service. Meanwhile, no-frills airlines would emerge, offering off-

peak, low-fare services for mostly leisure passengers. Under these scenarios, the variation in fares paid by travelers seated side-by-side on the same flight would be small.

Although some new single-class carriers did emerge after deregulation, the incumbent airlines quickly realized that they could efficiently serve both business and leisure travelers on the same flights.[6] Through hub-and-spoke networks and the economies of consolidating traffic at central hub airports, airlines could increase the number of scheduled flights from previous point-to-point schedules. The large increase in flight destinations and frequencies (i.e., the scope economies) were a boon to business travelers, particularly those traveling to cities with hub airports. Hub cities such as Charlotte, Cincinnati, and Detroit have experienced a 50 percent or more increase in scheduled jet departures sine 1985.[7]

Airlines recognized also that leisure travelers—self-identified by their willingness to accept booking restrictions—could be accommodated on many of the same flights as time-sensitive travelers. Seats that otherwise would fly empty could be sold at a significant discount, yet still cover incremental, or marginal, costs. Startup airlines focusing on leisure traffic—but unable to attract business travelers seeking frequent and convenient flights to numerous points—were at a significant disadvantage. Many failed within the first few years after deregulation. Moreover, it soon became evident that certain service amenities could be offered selectively to high-fare business travelers—for instance, accrual of free vacation trips, access to airport club lounges, upgrades to first class, and special boarding privileges.

Since deregulation, airlines have fine-tuned their fares using a complex combination of purchase terms such as Saturday-night stay-over restrictions, advance purchase requirements, and penalties for cancellations and exchanges. Yield-management practices—in which airlines reassess on a flight-by-flight basis how many seats are to be offered at a discount, by how much, and when—have proliferated and become more sophisticated with experience and advances in information technology. At any

[6] An early recognition of this possibility appeared when regulated airlines requested approval to offer "part charters" on regularly scheduled flights.

[7] These figures were derived from a review of DOT traffic schedules.

one time, an airline might be offering a dozen or more different coach fares on a given flight. Frequent–flier programs, now offered by nearly all airlines, also identify the most loyal customers—who generally are the most price-inelastic. These travelers receive additional bonus miles and other benefits, particularly when purchasing high-fare tickets. Airport security requirements that travelers must present personal identification before boarding also have enhanced the ability of airlines to price-discriminate, as low-fare travelers cannot resell their heavily restricted advance-purchase tickets (e.g., through intermediaries) to late-booking travelers, who must then pay the higher fares.

Trends in Fare Dispersion

Some insights into recent trends in fare dispersion can be gained by comparing the median fare paid by passengers in short-, medium-, and long-haul markets in 1992, 1995, and 1998. As shown in Table 1-1, the median fare in these three aggregate market groupings, based on market distance, has declined by about 15 to 20 percent over this 6-year period. The lowest fares (that is, the 10th percentile fares) also have fallen slightly in real terms—by about 5 percent. The higher-fare travelers (the 90th percentile), however, are now paying 5 to 25 percent more. Also evident is that these travelers are paying fares much higher than the median, at least in comparison with earlier periods (1995 and 1992). For instance, travelers paying the highest fares in 1992 paid 2 to 2.1 times the median fare. In 1998, these high-fare travelers paid 2.7 to 2.9 times the median.

It is possible that these increasing ratios are a misleading statistical artifact of increased low-fare service generally, which drives down the median fare and makes it smaller relative to the highest fares. Actually, the highest fares have risen in real terms and the medians have declined. As shown in Table 1-2, the top-fare travelers (95th percentile and above) accounted for 17 to 18 percent of airline revenue in 1998, compared with 8 to 13 percent in 1992.

The effect of Southwest Airlines on such aggregate fare data can be seen in Table 1-3. Although Southwest charges different fares to travelers based on certain demand and cost characteristics—by offering discounts for advance purchases—it does not vary fares to the same extent

Table 1-1 Distribution of Fares in Short-, Medium, and Long-Haul Markets, 2nd Quarters of 1992, 1995, and 1998 (adjusted to 1998 dollars)

	10th Percentile Fare ($)	25th Percentile Fare ($)	50th (Median) Percentile Fare ($)	75th Percentile Fare ($)	90th Percentile Fare ($)	95th Percentile Fare ($)
1998						
Short Haul	45	64	96	164	260	316
	(0.47 x median)	(0.67 x median)		(1.7 x median)	(2.7 x median)	(3.3 x median)
Medium Haul	76	95	126	177	339	469
	(0.60 x median)	(0.75 x median)		(1.4 x median)	(2.7 x median)	(3.7 x median)
Long Haul	98	135	176	256	517	705
	(0.56 x median)	(0.77 x median)		(1.5 x median)	(2.9 x median)	(4.0 x median)
1995						
Short Haul	47	71	101	164	231	291
	(0.46 x median)	(0.71 x median)		(1.6 x median)	(2.3 x median)	(2.9 x median)
Medium Haul	94	112	145	217	364	437
	(0.65 x median)	(0.77 x median)		(1.5 x median)	(2.5 x median)	(3.0 x median)
Long Haul	130	160	200	278	512	662
	(0.65 x median)	(0.80 x median)		(1.4 x median)	(2.6 x median)	(3.3 x median)
1992						
Short Haul	50	78	114	173	227	287
	(0.44 x median)	(0.68 x median)		(1.5 x median)	(2.0 x median)	(2.5 x median)
Medium Haul	78	107	156	228	327	379
	(0.50 x median)	(0.68 x median)		(1.5 x median)	(2.1 x median)	(2.5 x median)
Long Haul	103	137	204	294	420	486
	(0.50 x median)	(0.67 x median)		(1.4 x median)	(2.1 x median)	(2.4 x median)

NOTES: Fares were adjusted for inflation using the GDP price deflator. Fare data are from DOT's sample of every 10th ticket, computed by Database Products, Inc. Median fares were calculated based on all passenger traffic in each mileage block, excluding passengers with fares below $10. Other filters were applied to eliminate unusually high fares that were probably miscoded. Percentiles should be interpreted as the following example illustrates: travelers paying the "75th percentile fare" are paying fares higher than 75 percent of all travelers in the mileage block. The second quarters (May-June) were selected for each year because they avoid summer peaks and winter troughs, as well as major holiday travel periods. Short haul = 100 to 750 mi; medium haul = 751 to 1500 mi; long haul >1500 mi.

Table 1-2 Share of Total Airline Revenues Derived from Passengers Paying Lowest to Highest Fares for Short-, Medium-, and Long-Haul Markets, Second Quarters 1992, 1995, and 1998

	Percentage Share of Total Industry Revenues Derived from:				
	Passengers Paying Lowest Fares		Passengers Paying Highest Fares		
	1st to 25th Percentile	26th to 50th Percentile	51st to 75th Percentile	75th to 95th Percentile	> 95th Percentile
1992 2nd Quarter					
Short Haul	14	19	30	29	8
Medium Haul	12	20	24	30	13
Long Haul	13	20	24	30	13
1995 2nd Quarter					
Short Haul	15	18	25	32	10
Medium Haul	14	18	23	32	13
Long Haul	14	18	23	31	14
1998 2nd Quarter					
Short Haul	10	27	24	21	18
Medium Haul	13	16	21	34	17
Long Haul	12	16	21	34	17

Note: See Table 1-1 for explanation of data sources, calculations, and definitions.

as most other large airlines. High-fare travelers (90th percentile) on short-haul Southwest flights pay about twice the median fare for all Southwest passengers in those markets. By contrast, high-fare travelers paid three times the median on other larger incumbent carriers (American, Continental, Delta, Northwest, TWA, United, and US Airways) examined collectively. Part of this variation is attributable to a statistical distortion caused by combining traffic from several airlines, encompassing a wide mix of qualitative service differences and market demand and

Table 1-3 Distribution of Fares in Short- and Medium-Haul Markets for Southwest Airlines and Incumbent Carriers, 2nd Quarters of 1992, 1995, and 1998 (adjusted to 1998 dollars)

	25th Percentile Fare ($)	50th (Median) Percentile Fare ($)	75th Percentile Fare ($)	90th Percentile Fare ($)	95th Percentile Fare ($)
1998					
Short Haul					
• Southwest	48	63	85	114	122
	(0.76 x median)		(1.3 x median)	(1.8 x median)	(1.9 x median)
• Incumbents	71	114	223	353	456
	(0.62 x median)		(2.0 x median)	(3.1 x median)	(4.0 x median)
Medium Hall					
• Southwest	93	104	126	148	163
	(0.89 x median)		(1.2 x median)	(1.4 x median)	(1.6 x median)
• Incumbents	100	131	190	400	522
	(0.76 x median)		(1.5 x median)	(3.1 x median)	(4.0 x median)
1995					
Short Haul					
• Southwest	48	77	82	117	130
	(0.61 x median)		(1.1 x median)	(1.5 x median)	(1.7 x median)
• Incumbents	88	140	240	349	428
	(0.62 x median)		(1.7 x median)	(2.5 x median)	(3.0 x median)
Medium Haul					
• Southwest	101	116	138	161	186
	(0.88 x median)		(1.2 x median)	(1.4 x median)	(1.6 x median)
• Incumbents	124	162	250	424	507
	(0.76 x median)		(1.5 x median)	(2.6 x median)	(3.1 x median)
1992					
Short Haul					
• Southwest	50	63	87	121	133
	(0.79 x median)		(1.4 x median)	(1.9 x median)	(2.1 x median)
• Incumbents	101	160	247	349	401
	(0.63 x median)		(1.5 x median)	(2.2 x median)	(2.5 x median)
Medium Haul					
• Southwest	107	126	154	200	219
	(0.85 x median)		(1.2 x median)	(1.5 x median)	(1.7 x median)
• Incumbents	129	184	272	386	451
	(0.70 x median)		(1.5 x median)	(2.1 x median)	(2.5 x median)

NOTES: See Table 1-1 for explanation of data sources, calculations, and definitions. Incumbents consist of American, Continental, Delta, Northwest, TWA, United, and US Airways. Long-haul markets were not considered because Southwest carries few passengers beyond 1,500 mi. Fares are adjusted to 1998 dollars using the GDP price deflator.

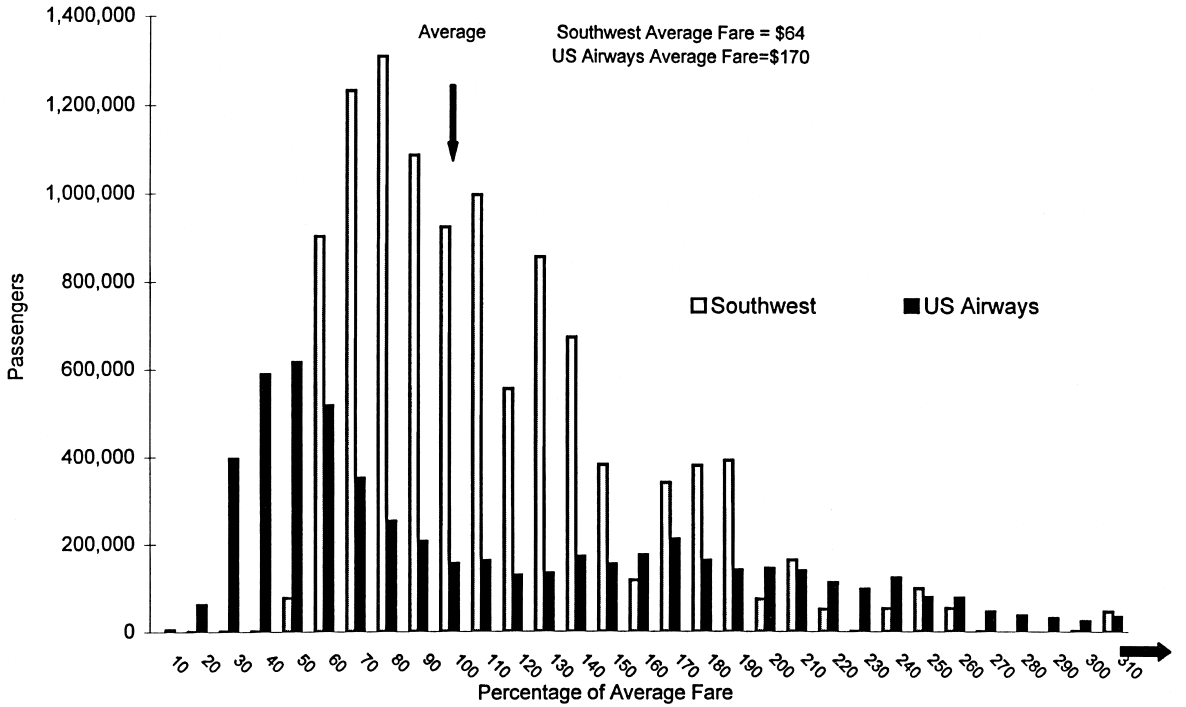
cost conditions, yielding a wider range of fares.[8] Still, a marked difference in the fare structure of Southwest Airlines and US Airways, two carriers of similar size and scope, is evident in Figure 1-3. While most short-haul travelers on Southwest Airlines pay fares close to the average, the differential is much greater for low- and high-fare travelers on US Airways.

A more precise means of measuring trends in fare dispersion is to use the Gini coefficient, first applied to airline fare analysis by Borenstein and Rose (1994). A Gini coefficient encompasses the entire distribution of fares, rather than specific percentiles. A Gini coefficient of zero indicates that all fares are the same; as it moves closer to 1, the fare distribution is more dispersed.[9] Figure 1-4 shows the Gini coefficients for fares since deregulation. The three trend lines represent different origin–destination (O-D) comparison groups: "O-D routes," comprising all tickets for all routes for all carriers, regardless of the number of connections (or segments); "O-D routes by segments" breaking down O-D traffic by the number of segments or nonstop routes (separating travelers on nonstop and connecting flights); and "O-D routes by segments and carriers" focusing on the dispersion at the carrier and segment levels (e.g, American nonstop itineraries, Continental one-stop itineraries). As the market definitions become narrower, the dispersion is reduced, suggesting that some fare dispersion at the O-D level is caused by individual carrier and segment differences.

As would be expected, the Gini coefficients are much higher today than in 1978, when CAB limited the amount of fare variation generally and on individual routes. A comparison of 1990 and 1998 levels shows

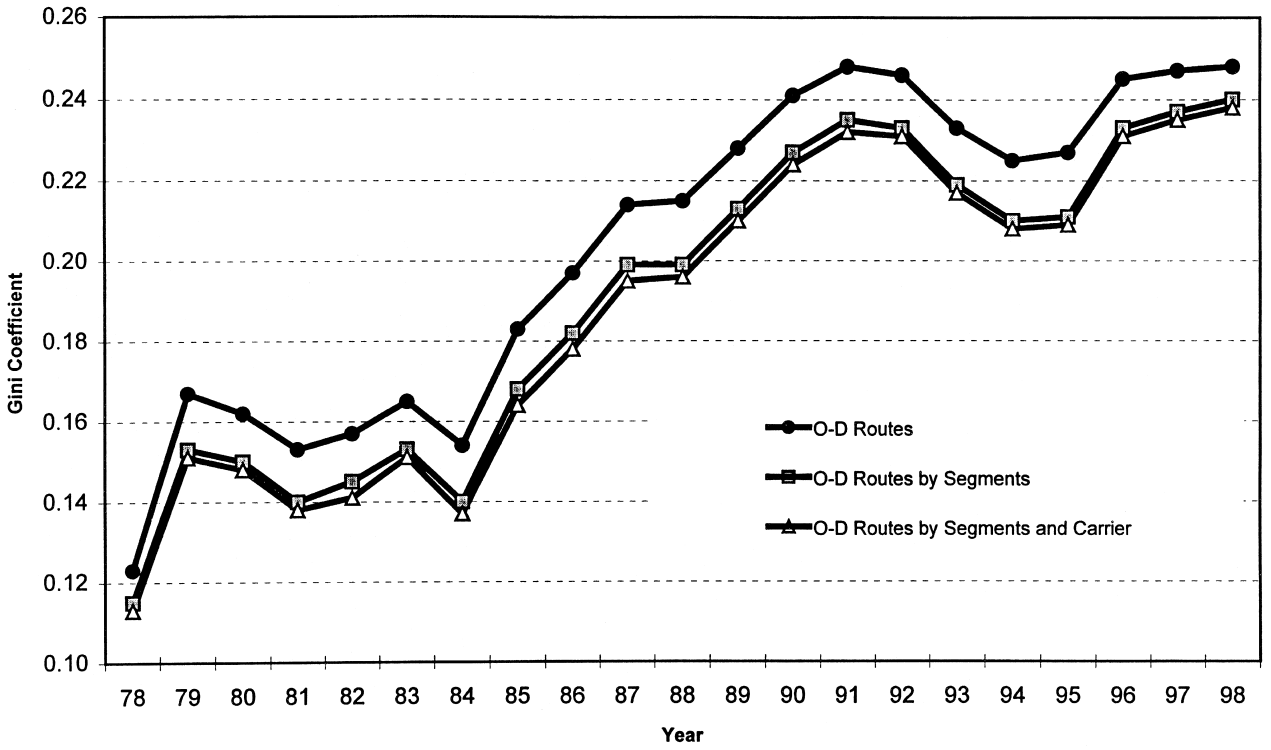
[8] Airport congestion, for instance, has been found to correlate with more fare dispersion, as might be expected from peak-load pricing (Borenstein and Rose 1994). As an example, Southwest schedules flights to avoid peak activity and heavily congested airports. In addition, because of variations in airport expenses and other site-specific costs (such as terminal charges) average fares vary more among short-haul markets than among long-haul markets. In long-haul markets, fuel and labor expenses, which are less variable across markets, account for a higher portion of overall costs.

[9] Perfect equality is when 50 percent of the travelers account for 50 percent of the fare revenue. To illustrate, a Gini coefficient of 0.2 indicates that two fares drawn at random would vary by 40 percent (2×0.2) from the mean in the market, however defined. Thus, in a market with an average fare of $100 and Gini coefficient of 0.2, the expected absolute spread in two randomly drawn fares would be $40.



NOTE: Short-haul trips are 750 miles or less. See Figure 1-1 for data sources. Average fares for Southwest and US Airways were $64 and $170, respectively.

Figure 1-3 Fare dispersion for short-haul trips on Southwest Airlines and US Airways, related to average fare for each carrier, 2nd quarter of 1998.



NOTE: Calculations by Steven Morrison. See text for description of Gini coefficient and its application to O-D routes by segment and carrier.

Figure 1-4 Fare dispersion in U.S. domestic airline markets using Gini coefficient.

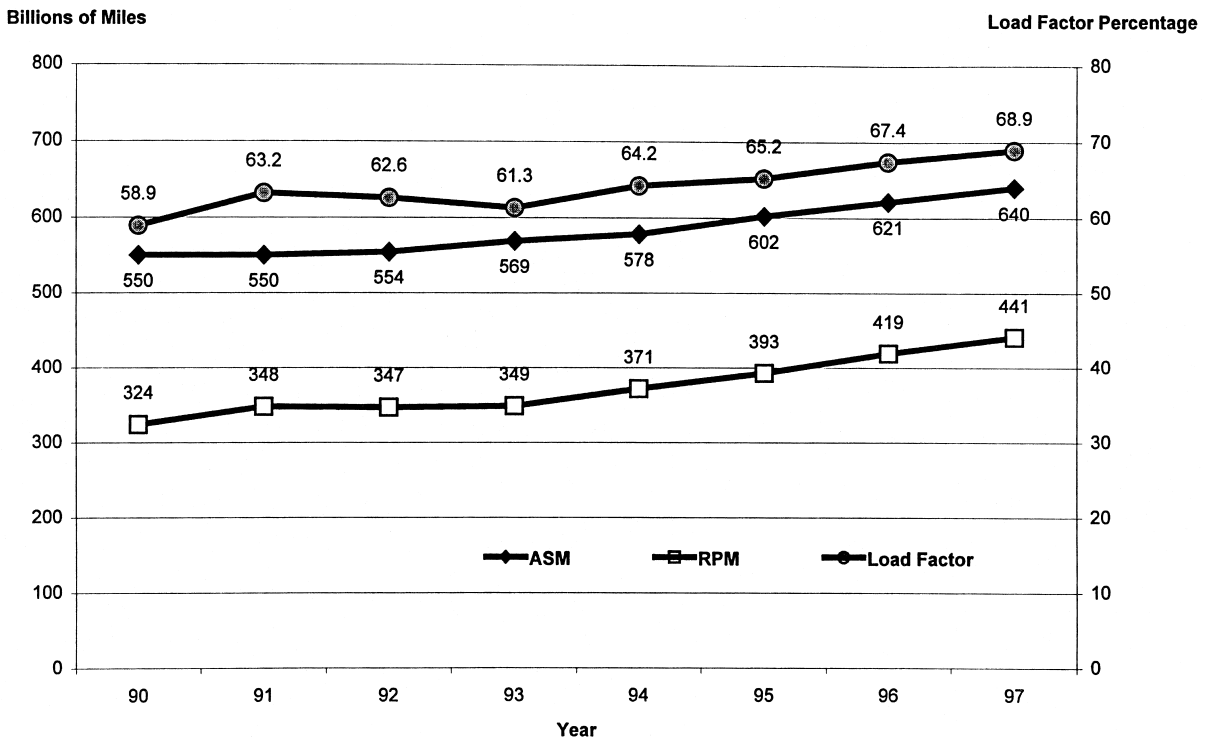
that the Gini coefficient has not changed significantly. Although there was a move upward from 1995 to 1997, these data do not, by themselves, offer evidence of airlines enjoying greater ability to price-discriminate during the 1990s. The discrepancy between the Gini coefficient and the median–fare analyses presented earlier needs to be reconciled, although time did not permit further evaluation in this study.

Other Factors Contributing to Fare Dispersion

The airline industry has been prone to wide cyclical swings. As discussed at length in *Winds of Change*, excess capacity has been a recurrent problem for the industry during and shortly after recessions. Figure 1-5 shows industry trends in revenue passenger-miles and available seat-miles during the 1990s. The gap between the two graphs indicates empty seats, or underutilized capacity. Excess seat capacity has declined during the decade, as indicated by average load factors, which rose from 60 percent in 1990 to nearly 70 percent in 1998. Low load factors early in the decade reflect the drop-off in demand during the 1990 to 1991 recession, coupled with expanded capacity. More recently, higher load factors reflect an industry with high demand and intensive use of capacity.

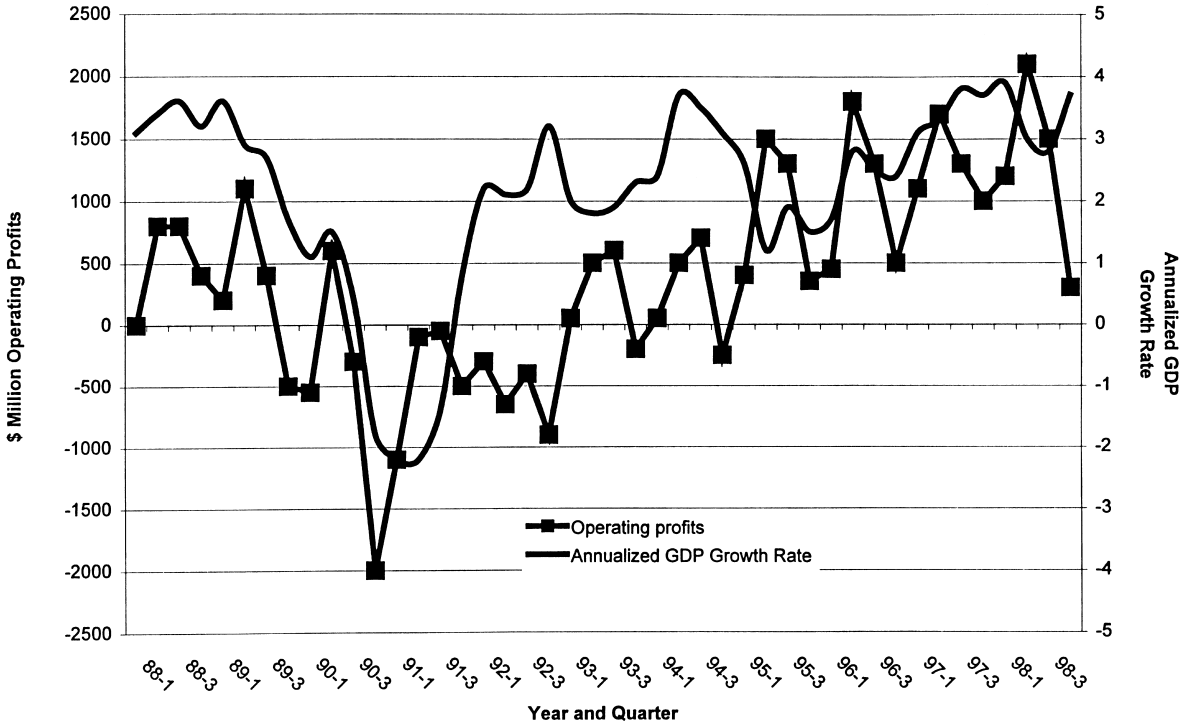
In the past—notably in the early 1990s—whenever failing airlines attempted to generate revenues from underused capacity by sharply lowering fares, other airlines followed suit. The resulting fare wars benefited travelers in the short term. However, for well-run private airlines to survive and prosper, fares eventually must rise to levels sufficient to recover long-term costs and keep capital in the industry. As shown in Figure 1-6, incumbent carriers experienced large losses during the early 1990s recession, but have since experienced positive operating profits, often at record levels.

The increases in unrestricted fares observed in recent years have been justified at least in part as restoring the industry's total returns from the large losses it suffered in the early 1990s. This committee lacked the time and resources to make a comprehensive assessment of the industry's financial performance—both currently and historically—that would be necessary to reach a definitive judgment on this. Although observed increases in the fares charged to price-inelastic travelers might be evidence that airlines are exercising their market power, it is unclear that these fare



Source: FAA 1998, IX-16.

Figure 1-5 Trends in annual seat-miles (ASM), revenue passenger-miles (RPM), and load factors for all domestic jet carriers, 1990–1997.



NOTE: Incumbents consist of American, Continental, Delta, Eastern, Northwest, Pan Am, TWA, United, and US Airways.
SOURCE: Dresner and Windle 1999.

Figure 1-6 Operating Profits of Incumbent carriers (1998 dollars).

increases have been excessive, exploiting market power. Perhaps the only check against such exploitation is to ensure that opportunities for competitive entry are made available and not impeded.

MARKET AND INDUSTRY ENTRY TRENDS

There are several ways to examine entry activity in the airline industry. Because carriers compete for passengers in individual airport-pair markets—discussed in the next chapter—entry into these markets is of particular interest. An entrant in an airport- or city-pair market can be a new airline offering service on the route for the first time or an incumbent expanding operations. To assess entry trends and influences, the study committee commissioned a paper on resource availability and new entry in the domestic airline industry from Martin Dresner and Robert Windle of the University of Maryland Robert H. Smith School of Business.[10] Their paper serves as the basis for the following discussion on recent entry trends.

Trends in Market Entry Activity

Focusing on airlines operating jet aircraft with 70 seats or more,[11] Dresner and Windle examined both entry and exit patterns at the individual route level (segment or nonstop airport-pair market) for the period 1989 to 1998. As shown in Figure 1-7, the rate of carriers beginning service on nonstop routes[12] was relatively stable throughout most of the 1990s, fluctuating between 100 and 200 entries per quarter. Route-level entry, however, began to decline in 1996. A notable subtrend was that quar-

[10] The commissioned paper (Dresner and Windle 1999) is available from TRB or from the authors (Robert H. Smith School of Business, University of Maryland, College Park, MD 20742).

[11] This distinction was made to ensure consistency with this study, which focuses on competition among airlines operating large jet aircraft. Commuter airlines, which operate smaller aircraft, are generally viewed as offering services that complement rather than compete with, those of larger commercial airlines.

[12] Determined from DOT's traffic schedules, and excluding observations with 10 or fewer operations during the quarter.

terly entries by incumbent carriers (American, Continental, Delta, Northwest, TWA, United, and US Airways) had been falling throughout the decade. Entries by other, nonincumbent carriers—influenced by Southwest—generally increased during each quarter in the first half of the 1990s, as shown in Figure 1-8. Yet starting in 1996, entry activity by new carriers also began to decline.

A review of total net entries—route exits subtracted from entries—shows negative figures in most quarters during the 1990s (with a large negative in late 1990, following the demise of Eastern and Pan Am—see Figure 1-9). Net entries by nonincumbents were positive in nearly all quarters from 1992 to 1996; however, since 1996 these carriers have tended to exit more routes than they have entered. Still, these airlines, led by Southwest, have entered nearly 2,000 markets (nonstop segments) during the past six years, and net market entries—that is, entries minus exits—have been positive on balance, exceeding 500.

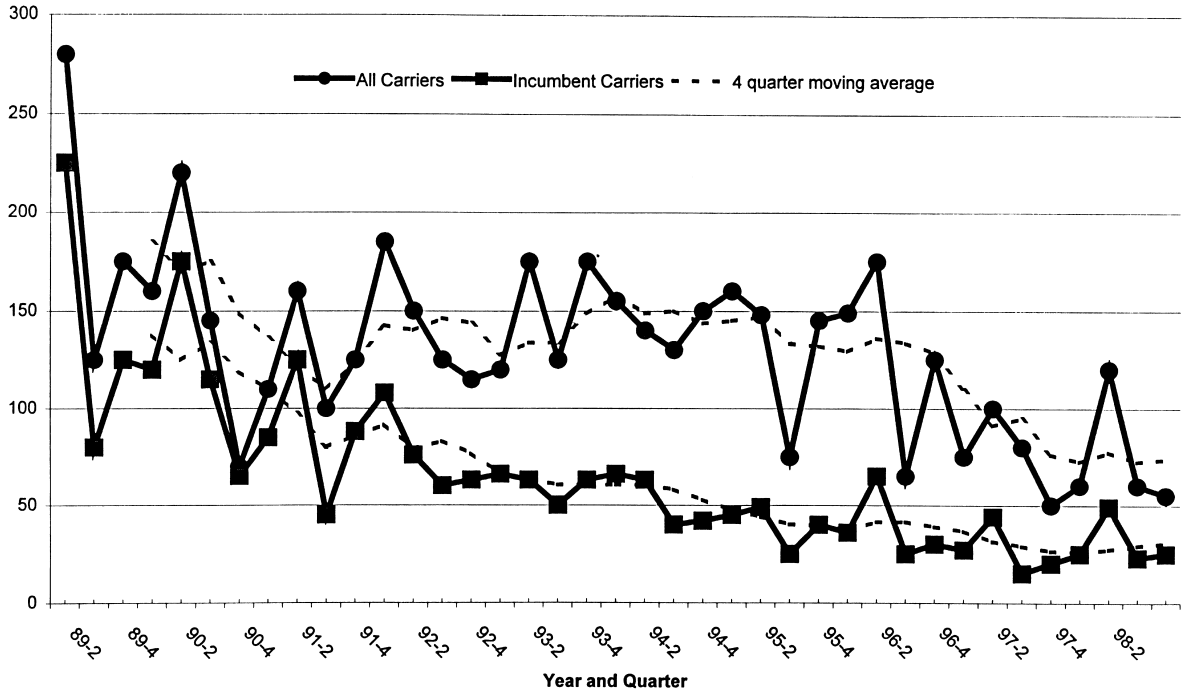
Explanations for these entry trends vary. The notable decline in entries beginning in 1996 has led many observers to conclude that a primary cause was the Florida crash of a ValuJet DC-9 in May of that year.[13] ValuJet's suspension and subsequent renewal of operations following the crash undoubtedly influenced the total number of market entries and exits. Negative public reactions to the crash, as well as the uncertainties of plans by the Federal Aviation Administration (FAA) to increase oversight of newly certified airlines,[14] also are viewed by some as adversely affecting the financial performance of other low-fare airlines, reducing their access to capital, and hindering their ability to expand.[15] As discussed later in this chapter, the number of brand-new carriers entering the industry, as well as new applications for certification, declined following the crash.

---

[13] On May 11, 1996, ValuJet flight 592 crashed in the Florida Everglades. All 110 people onboard were killed. On June 18, ValuJet suspended its operations. With FAA approval, ValuJet restarted in late September 1996.

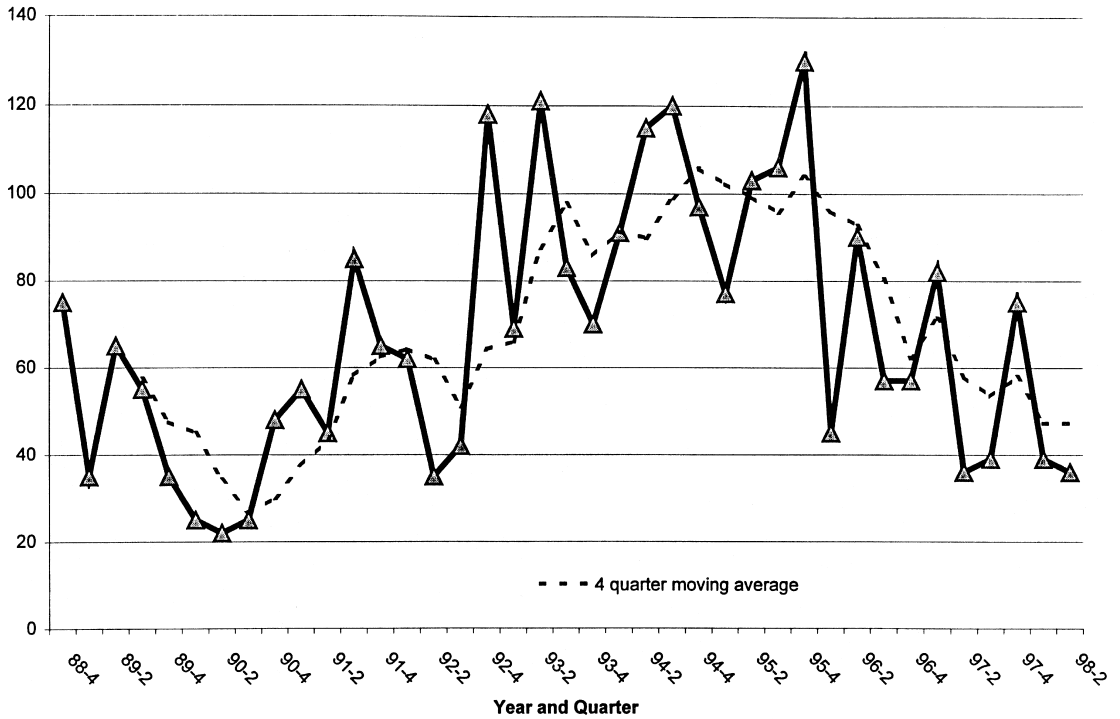
[14] Following a 90-day review of its safety program, FAA announced its intention to heighten surveillance of newly certified airlines (see GAO 1997).

[15] For example, Nethercutt and Pruitt (1997) show statistically significant losses in the stock portfolios of low-cost airlines following the ValuJet crash.



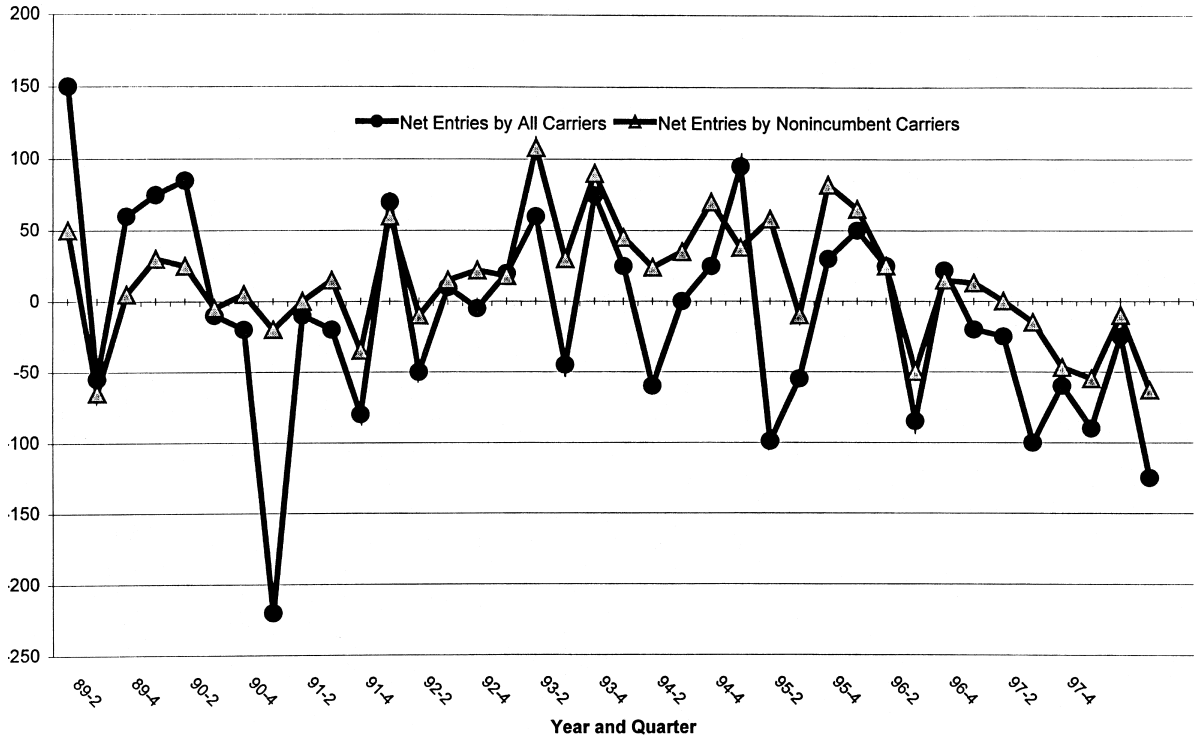
NOTE: A nonstop route is a flight segment operated by a carrier. See Figure 1-6 for list of incumbents. Source of data is DOT traffic schedules. Calculations by Database Products, Inc.
SOURCE: Dresner and Windle 1999.

Figure 1-7 Quarterly counts of new nonstop routes served by carriers using jet equipment with at least 70 seats.



NOTE: See Figure 1-7 for definitions and data sources.
SOURCE: Dresner and Windle 1999

Figure 1-8 Quarterly counts of new nonstop routes served by nonincumbent carriers using jet equipment with at least 70 seats.



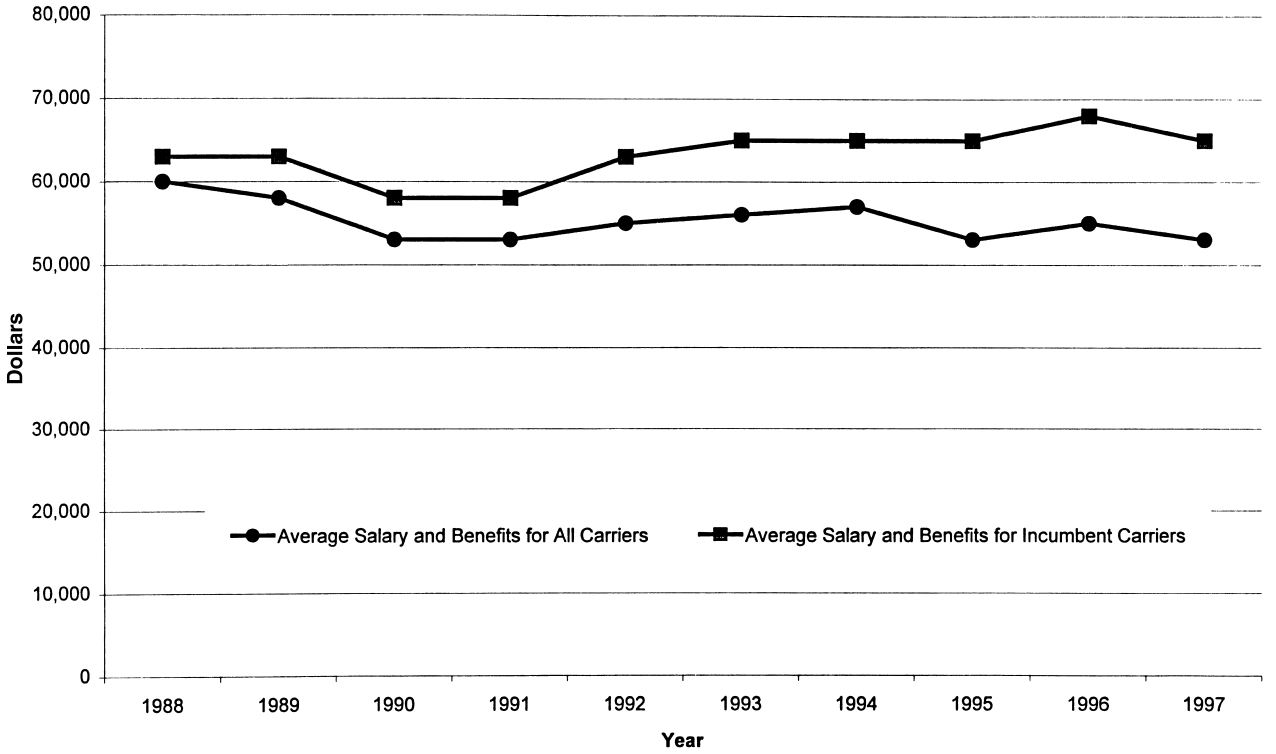
NOTE: Net entries equals the number of new routes entered minus the number of routes exited. See Figure 1-7 for definitions and data sources.
SOURCE: Dresner and Windle 1999

Figure 1-9 Quarterly net new nonstop routes served by carriers using jet equipment with at least 70 seats.

Other Possible Influences on Entry

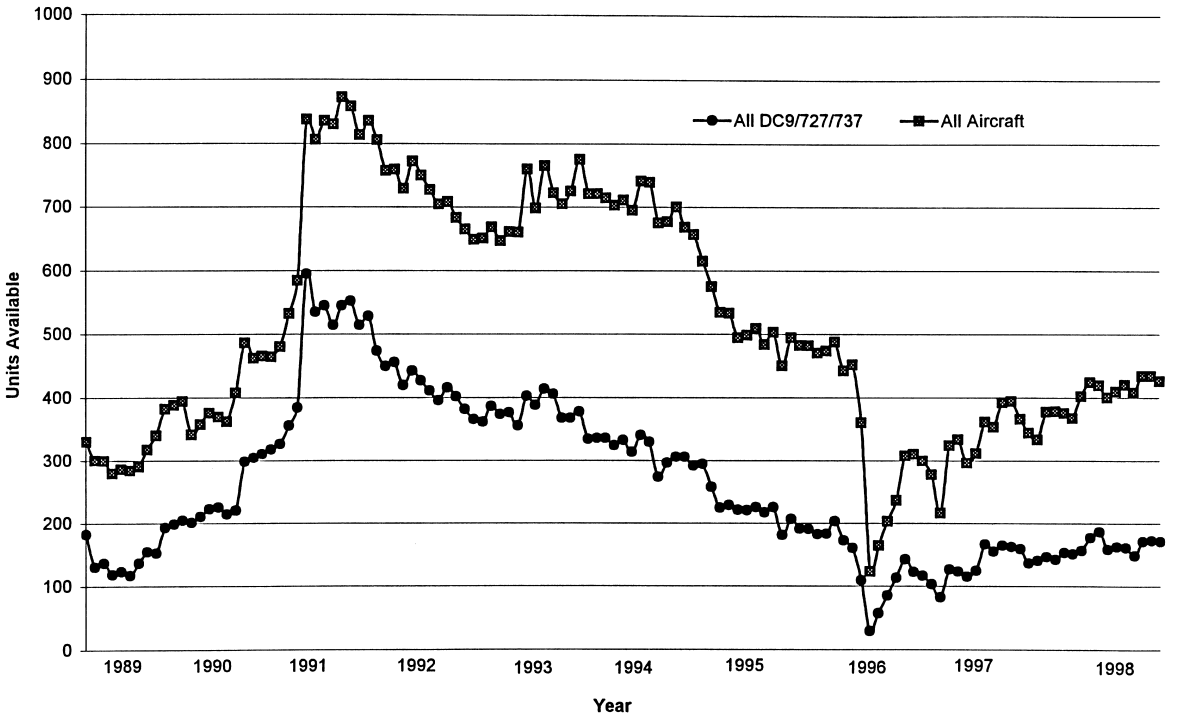
Dresner and Windle did not examine the influence of the ValuJet incident on entry activity but focused on two other possible determinants—labor costs and aircraft availability. A commonly held but largely intuitive belief among industry observers is that when the supply of labor and flight equipment is tight—and accompanied therefore by high prices—the expense of starting and operating a new airline will dissuade startups. A tightening in the supply of these resources might even cause some airlines that depend on low-cost labor and equipment to cut back or fail. Conversely, when supply is ample, an increase in the number of startup airlines might be expected. Liquidation of several large airlines during the late 1980s and early 1990s presented significant opportunities for startups at the beginning of the decade.

However, simple trends in the cost and availability of these production factors do not confirm such clear relationships. Figure 1-10 shows the average salary per employee, adjusted for inflation, for all airlines and for incumbents only. The trend lines indicate that employee compensation had been rising in real terms for incumbents, but not for other carriers. This difference would suggest a comparative advantage for nonincumbents, possibly generating more entries. On the other hand, a review of the supply of the three common kinds of narrow-body aircraft typically used by new entrants—Boeing 737, Boeing 727, and DC-9—suggests that reduced availability of, and higher prices for, flight equipment beginning in the mid-1990s might have hindered entries (Figure 1-11). During the latter half of the 1980s, many large airlines increased aircraft capacity significantly, driving up the price of these and many other used narrow-body aircraft (Figure 1-12). As these airlines began to shed their excess equipment during and following the 1990–1991 recession, prices fell sharply, providing an opportunity for startup carriers. Aircraft listed for sale or lease declined, however, during the early to middle 1990s, with a particularly sharp dropoff in 1995 to 1996 following the ValuJet crash and the temporary removal of many narrow-body aircraft from the market. In recent years, the availability of these aircraft has risen, partly because of a large number of new aircraft deliveries (see Dresner and Windle paper for data). After the sharp decline in market prices during the early 1990s, however, prices for used narrow-body jets began to stabilize during the middle part of the decade (Figure 1-12).



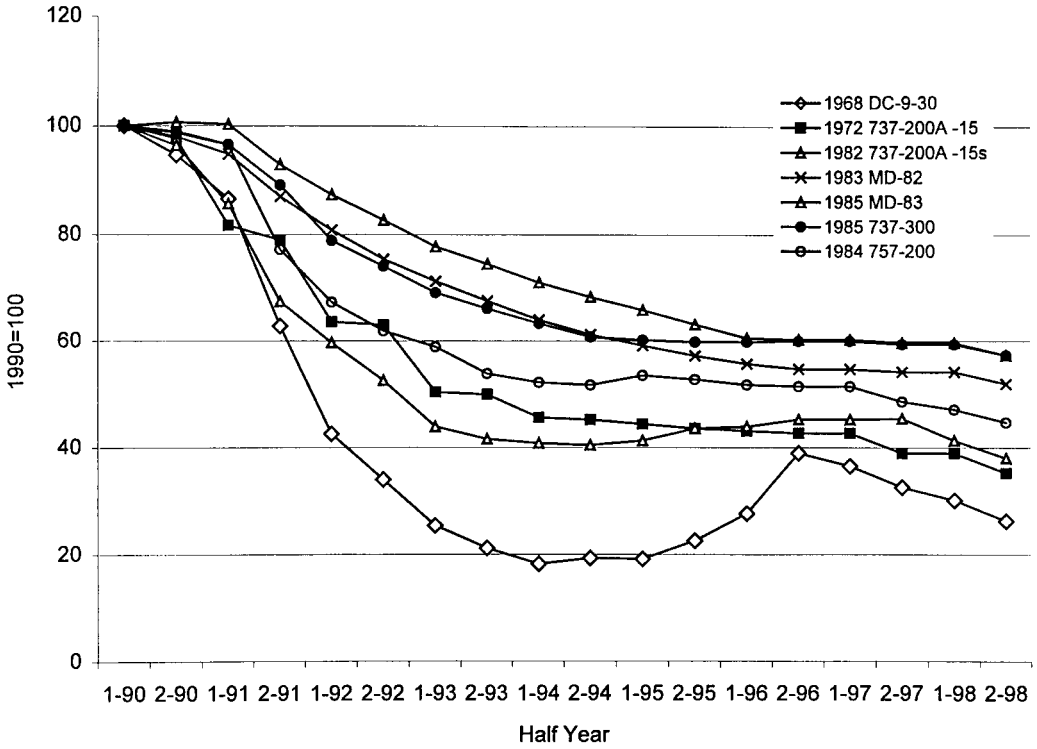
SOURCE: Dresner and Windle 1999

Figure 1-10 Average salary per employee for all carriers and for incumbent carriers only (1998 dollars).



NOTE: Data provided by BACK Associates.
SOURCE: Dresner and Windle 1999.

Figure 1-11 Monthly listings of used aircraft available for sale or lease worldwide: DC-9s, B-727s, B-737s, and all aircraft types.



SOURCE: GRA Aviation Specialists, Inc.

Figure 1-12 Indexed market valuations (adjusted for inflation) of used narrow-body aircraft, 1990 to 1998.

Analyses by Dresner and Windle showed some slight correlation between these two factors—employee compensation and aircraft availability—and net entry activity. However, this was an area of inquiry the committee did not have time to consider fully. Nonetheless, the influence of underlying economic factors should be considered when monitoring entry and exit patterns in the industry and analyzing their possible causes.

A general conclusion that can be reached from these assessments is that there has been much entry and exit activity in the airline industry during the past decade. Shifting in and out of markets is apparently common in the airline industry, although entry activity during the latter part of the decade seemed to decline. While several possible reasons have been presented for this recent trend, its overall significance and causes remain uncertain.

RESURGENCE OF LOW-FARE SERVICE

Probably the most significant development in the U.S. airline industry during the past decade has been the continued expansion of Southwest Airlines and the resurgence in low-fare entry generally.

Southwest Airlines

Established as a Texas intrastate carrier in 1971, Southwest started flying to markets outside of Texas immediately after deregulation; it now serves hundreds of domestic city-pairs far from its original base at Dallas' Love Field.

Although the number of city-pair markets served by Southwest has grown substantially during the past decade, the carrier has retained its basic operating strategy, which is to serve short-haul (usually less than 750 mi), dense routes (offering a potential of 500 passengers per day) with frequent flights and low fares. When serving the nation's largest markets, Southwest often chooses to fly from secondary airports, such as Midway in the Chicago area, Oakland in Northern California, and recently MacArthur Field in metropolitan New York. Unlike other major airlines, Southwest does not need to operate hub-and-spoke networks to fill its aircraft, since it concentrates service in dense, short-haul

markets in regions with enough population to generate sufficient local traffic to sustain nonstop service. Although it specializes in point-to-point service, Southwest's significant presence in some airports (such as Love Field in Dallas, Hobby Field in Houston, St. Louis, Salt Lake City, Oakland, and Baltimore–Washington International) permits a fair amount of one-stop service. Nevertheless, by minimizing the idle time for its aircraft parked at gates to receive connecting passengers (a routine wait for airlines operating connecting banks), Southwest is able to keep its aircraft flying and generating revenues.

Southwest is the archetypal—as well as in major respects a unique—low-cost, high-productivity airline. An important source of the airline's cost savings and efficiencies is its avoidance of congested primary airports in large cities. Delays are costly to airlines, undercutting optimal use of aircraft and labor. To minimize costs, Southwest has targeted many secondary, underused airports near large cities, encountering less air traffic control delays as well as less congestion in ground handling both for aircraft and passengers, and lower facility and service fees (see Table 1-4). However, because it relies on point-to-point service between secondary airports, often less convenient for travelers, Southwest must generate higher passenger volumes through lower prices. Low fares and high aircraft use are imperative to its operating strategy.

When it does fly into the major airports of large cities—and in some cases, into the hubs of incumbents (e.g., Detroit, Salt Lake City, and St. Louis)—Southwest seldom schedules flights during the peak take-off and landing times, choosing the periods between connecting banks. By avoiding congested airports and the peak activity of other carriers, Southwest can use its fleet most productively.

Southwest achieves other important efficiencies through its uniform, all-coach fleet of Boeing 737s. These aircraft are well suited to short-haul, dense markets, and using a single type of aircraft simplifies maintenance, in-flight service, pilot training, and spare parts inventory. Additionally, Southwest participates in only one computer reservation system (CRS) and emphasizes direct customer purchases of tickets, saving on travel agent commissions and other booking fees. It also eschews seat assignments to speed aircraft boarding. For the most part, Southwest does not achieve cost savings and efficiencies through lower wages (common for

Table 1-4 Passenger Traffic on Southwest Airlines in Busiest U.S. Airports and Largest Metropolitan Areas, 4th Quarter, 1998

25 Busiest Airports by Enplanements[a]	Enplanements by Southwest	Enplanements by Southwest in Secondary Airports	Metropolitan Area
ORD	--	635,384 MDW	Chicago
ATL	--	--	Atlanta
LAX	750,486	853,426 ONT/BUR/SNA	Los Angeles
DFW	--	814,203 DAL	Dallas
SFO	99,196	764,092 OAK	San Francisco
MIA	--	188,911 FLL	Miami
DEN	--	--	Denver
JFK	--	--	New York
DTW	122,383	--	Detroit
PHX	1,043,034	--	Phoenix
LAS	1,017,901	--	Las Vegas
EWR	--	--	New York
STL	418,513	--	St. Louis
MSP	--	--	Minneapolis
BOS	--	240,464 PVD/MHT	Boston
IAH	32,443	842,740 HOU	Houston
MCO	229,377	--	Orlando
SEA	182,668	--	Seattle
LGA	--	--	New York
PIT	--	--	Pittsburgh
SLC	205,920	--	Salt Lake City
PHL	--	--	Philadelphia
CVG	--	--	Cincinnati
DCA	--	481,566 BWI	Washington, D.C.
SAN	563,337	--	San Diego
TOTAL	4,665,258	4,820,786	

[a] Ranked according to 1996 enplanement totals, including international enplanements. See Appendix D for airport identification codes.

other low-fare carriers), but through constant economizing and efficient and intense use of its labor and equipment.

With its low-fare strategy, Southwest successfully has generated high traffic volumes in many secondary airport-pair markets (e.g., Ontario, California–Oakland, California) and has pressured other airlines to lower their fares not only in the same markets but in related airport-pair markets (e.g., Los Angeles–San Francisco). Table 1-5 illustrates Southwest's effect on fares and traffic in the markets it enters. In 160 short-haul (less than 750 mi) airport-pairs that Southwest entered for the first time between 1990 and 1998, annual passenger traffic increased by more than 20 million (174 percent), and average yields adjusted for inflation

fell by 54 percent. Southwest has accounted for about two-thirds of the passengers and nearly all of the traffic growth in the more than 300 short-haul airport-pair markets it now serves, as shown in Table 1-6.

No other airline operates in the same way on the same scale as Southwest Airlines. This airline alone accounts for about 75 percent of the passenger traffic carried on low-fare airlines as defined by DOT (see Figure 1-13). Most other low-fare airlines do not pursue the strategy of inaugurating significant service at secondary airports.[16] Yet this strategy has allowed Southwest considerable cost savings despite the risks of untested markets and the need to improve the secondary airports. Only once—with Detroit's City Airport—has Southwest abandoned its secondary airport strategy because of insufficient supporting infrastructure (e.g., ground services) and tepid interest from travelers. By offering frequent flights, Southwest also attracts a significant amount of business traffic, and therefore it is not typical of the low-fare airlines that have served secondary airports by focusing on leisure clientele.

Unlike Southwest, many newer low-fare airlines seeking business traffic have elected to compete directly with major carriers on their hub routes. Some operate out of the main hubs of major airlines (e.g., AirTran in Atlanta, Frontier Airlines in Denver); others have established bases in spoke cities and concentrated service in dense hub-spoke routes (e.g., Vanguard, based in Kansas City, operates routes to Min-

Table 1-5 Change in Average Yield (Adjusted to 1998 Dollars) and in Passenger Traffic in Markets Entered by Southwest Airlines During the 1990s

	1990	1997-98	Percent Change
Passenger Trips	12,170,210	33,372,310	174%
Average Yield (cents/mi)	32.40	14.80	-54%

NOTES: See Table 1-1 for explanation of data sources and definitions. Includes only markets that Southwest did not serve in 1990 but where it accounted for 10 percent or more of total market passenger trips in the full year from 1997 3rd Quarter to 1998 2nd Quarter. The GDP price deflator was used to adjust for inflation.

[16] However, some low-fare carriers might enter the market after an entry by Southwest.

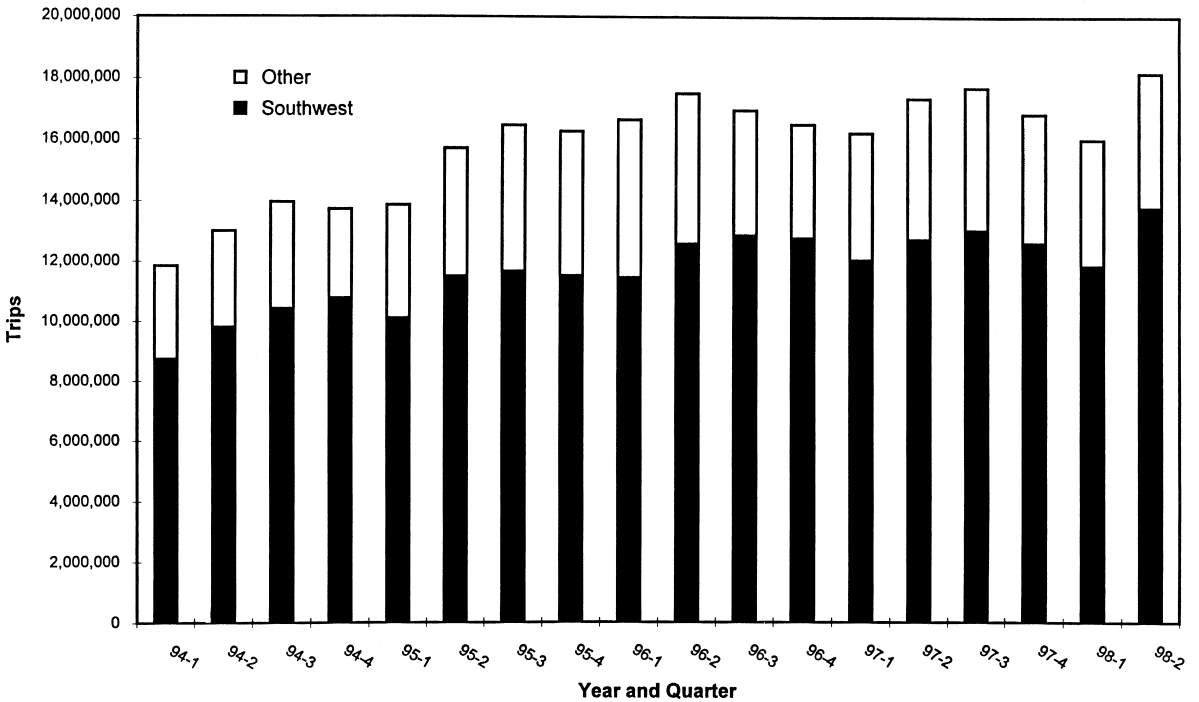
Table 1-6 Average Yield for Trips in Short-Haul Markets Served by Southwest Airlines, 3rd and 4th Quarters of 1997 and 1st and 2nd Quarters of 1998

Passengers per Day Each Way	Carrier	Total Share of Passengers Carried	Passengers	Average Yield (cents/mile)
≥500	Southwest	63	21,317,380	17.78
N=55	Other	37	12,284,830	16.28
	Subtotal	100	33,602,210	17.23
250 to 499	Southwest	73	8,247,880	18.88
N=45	Other	27	3,021,230	16.84
	Subtotal	100	11,269,200	18.33
125 to 249	Southwest	67	5,614,250	16.96
N=70	Other	33	2,734,330	18.06
	Subtotal	100	8,348,580	17.32
50 to 124	Southwest	57	1,637,690	16.33
N=54	Other	43	1,256,320	17.93
	Subtotal	100	2,894,010	17.02
20 to 49	Southwest	54	670,090	16.82
N=48	Other	46	563,620	16.03
	Subtotal	100	1,233,710	16.46
5 to 19	Southwest	60	217,710	16.08
N=44	Other	40	145,430	17.54
	Subtotal	100	363,140	16.66
All	Southwest	65	37,705,000	17.81
N=316	Other	35	20,005,850	16.71
	Total	100	57,710,850	17.43

NOTES: See Table 1-1 for explanation of data source and calculations source. Markets are based on airport pairs in which Southwest accounted for 10 percent or more of total O-D trips. N=Number of markets. 1 mile = 1.61 kilometer.

neapolis, Chicago, Pittsburgh, and Dallas–Ft. Worth). By comparison, Southwest has not sought access to slot-controlled airports and has avoided busy hubs, even forsaking such large markets as Minneapolis and Atlanta.

Arguably, Southwest also has provided the impetus for many incumbent carriers to establish low-fare divisions, such as Metrojet (US Airways), Delta Express, and United Shuttle. Incumbents generally



NOTE: DOT considers the following as low-fare carriers: AirTran, Air South, ValuJet, Western Pacific, American Transair, Reno, Spirit, Vanguard, Nations, Carnival, Kiwi, Morris, Tower, Pro Air, and Frontier. Several smaller carriers not included.

Figure 1-13 Total passenger trips on low-fare carriers: Southwest Airlines and others.

have deployed these low-fare, no-frill brands as competitors for Southwest and other low-fare airlines in secondary airport-pairs in major metropolitan markets. Seldom will a low-fare division fly between major airports already served by the incumbent. Because traffic and fare data for these low-fare divisions are aggregated with those of the main incumbent, it is difficult to assess their overall effects on prices and service.

Startup Airlines

Earlier Entrants

In the decade following deregulation, 1978 to 1988, the airline industry was awash in new entries—not only new airlines, but also the expansions of major, regional, and intrastate carriers. Dissatisfied with the economics of point-to-point service, most incumbents strengthened or adopted hub-and-spoke systems that allowed for extensive route networks. Free to realign their routes, incumbent carriers sought to balance traffic flow at their hub airports by expanding their networks into new city-pair markets. For instance, Eastern Airlines—which traditionally had carried East Coast north-south traffic—expanded its network westward; similarly, United Airlines, which had focused primarily on east-west traffic, moved into many northern and southern city-pair markets from its Chicago and Denver hubs (Bailey et al. 1985). US Airways and Delta extended their networks by merging with Piedmont and Western Airlines, respectively.

Deregulation was expected to lead major airlines to realign their route networks, but also to offer opportunities for smaller regional and intrastate carriers to extend their systems, as well as for charter (or supplemental) operators to move into interstate service. Local-service airlines such as Allegheny, Frontier, Piedmont, and Ozark previously had been prevented by CAB from entering longer-haul and larger markets. Meanwhile, intrastate airlines not subject to CAB regulation—such as Air Florida, Southwest Airlines (Texas), Air California, and Pacific Southwest Airlines (California)—now could offer interstate service; so too could such established charter airlines as World Airways and American Trans Air.

In October 1978, Midway Airlines became the first completely new airline in 38 years to be granted a CAB certificate; it was quickly followed by New York Air, Muse, People Express, and several others. Over the next half dozen years, CAB would certify an additional two dozen brand-new airlines and would approve the expansion of many established intrastate and charter carriers. Some of these new airlines entered mainline, short-haul routes, offering nonstop, point-to-point service in markets with high passenger volumes—like New York Air, flying between LaGuardia and Washington National.

Without expensive labor contracts, many of these new airlines had lower cost structures than incumbents. They could offer much lower fares to attract travelers away from incumbents and to induce demand for new leisure traffic. At first, some incumbents allowed the new airlines to maintain a price advantage, but as price-sensitive passengers switched to the new airlines, declining load factors compelled incumbents to match the lower fares. Without the price advantage, the growth rates of new entrants slowed considerably; travelers chose airlines with established reputations especially when offered higher levels of service. Faced with aggressive responses, as well as a recession and rising fuel prices, some new airlines failed quickly (e.g., Altair, Golden West), while others changed their operating strategies, concentrating service in secondary airports such as Midway and Newark. Some new entrants also began to stress connecting services in their route planning, to increase load factors as well as flight frequencies that might attract business travelers. For instance, the low-fare carrier People Express established hubs in Newark and—after purchasing Frontier—in Denver. America West Airlines, formed in 1983, established a hub in Phoenix.

Retaining cost advantages was one of the challenges new airlines faced as they matured and expanded their networks, sometimes by purchasing established airlines (Meyer and Oster 1987). Escalating costs coupled with operating strategies like those of mainline carriers proved problematic in competing for service-oriented traffic. Most notably, People Express switched from a strategy of serving niche markets with high leisure traffic volumes (e.g., Newark–Jacksonville) to serving more traditional but heavily congested, large markets such as Newark–Chicago. Shortly before declaring bankruptcy, Midway Airlines redoubled its efforts to attract business travelers, expanding into Philadelphia by

obtaining airport gates from Eastern Airlines. Air Florida, which offered a mix of high and low fares on unconventional routes, such as White Plains to Chicago O'Hare, could not generate passenger volumes sufficient to compete with the major airlines offering service between primary airports, such as Chicago–LaGuardia (Meyer and Oster 1984, 127).

By 1990, nearly all of the airlines created in the wake of deregulation had failed or had been purchased by incumbent airlines. In addition, many of the former intrastate carriers (e.g., Air Florida) and some larger airlines (e.g., Braniff) had failed, or merged with other incumbents (Western and National), or were on the verge of failing (Eastern and Pan American). Most of the large local service (i.e., regional) airlines had merged with larger airlines (e.g., Ozark with TWA, Republic with Northwest). Only two airlines formed soon after deregulation are still offering jet service today (America West, formed in 1983, and Midwest Express, formed in 1984), along with one former intrastate carrier (Southwest) and one former charter operator (American Trans Air). Only the last two are consistently pursuing low-fare strategies.[17]

Although there are many explanations for the survival of so few of the airlines formed immediately after deregulation, the demise of so many undoubtedly has contributed to concerns that recent startups will suffer similar fates.

Latest Entrants

Following a dearth in startup and a recession that dampened air travel demand in the early 1990s, new entries surged again later in the decade. More than 20 new airlines were certified for operation and achieved operating status from 1992 to 1996 (see Figure 1-14).[18] No new airlines were certified in 1997, but three applicants were granted certification in 1998.[19] During the 1990s, about half as many airlines

[17] America West still retains a low-fare strategy in many markets, in comparison with incumbents.

[18] America West still retains a low-fare strategy in many markets, in comparison with incumbents.

[19] Four applicants were awaiting DOT certification reviews in the second quarter of 1999.

have exited the industry as have entered, including several startup airlines, such as Air South (1994–1997) and Western Pacific (1995–1997). Two incumbents, Eastern and Pan American, also exited. Some startups merged with larger airlines, including Morris Air with Southwest in 1995, and more recently, Business Express and Reno Air with American Airlines. Other startups, such as Nation's Air Express and Grand Airways, operated briefly but never managed to generate significant passenger traffic.

Nevertheless, many of the startup airlines from the early to mid-1990s continue to operate, including AirTran Airways (formed from a merger of startups ValuJet and AirTran Airlines), Spirit, Vanguard, Frontier, and Midway.[20] Joining these are some others that began scheduled air service in the late 1980s, most notably American Trans Air and Tower Air. With the exception of Midway, all of these new entrants operate primarily as low-fare airlines.

Similar to the first wave of startups after deregulation, the airlines in this second wave have adopted varying operating strategies. Some have concentrated on leisure traffic in tourist markets like Florida, while others have sought a mix of business and nonbusiness travelers in nontourist markets. For the most part, however, they have expanded their operations slowly, particularly compared with some of the low-fare airlines formed in the wake of deregulation, such as People Express. Though most operate point-to-point service, several have set up bases in the hub airports of major airlines, to take advantage of high traffic volumes and the relatively high fares offered by incumbents.

Before its purchase by Southwest, Morris Air operated from Delta's hub in Salt Lake City. Frontier Airlines initiated service from United's hub in Denver, flying short-haul, nonstop, low-density routes such as Fargo, Grand Forks, and Bismarck. Frontier since has added flights to larger markets such as Albuquerque, Las Vegas, and El Paso. It has also added flights on major hub-to-hub routes such as Denver to Atlanta and Dallas–Fort Worth. The main base of operations for AirTran Airways

[20] Frontier and Midway differ from the original Frontier—which was established as a local carrier under CAB regulations—and from the original Midway Airlines, formed shortly after deregulation.

SOURCE: Dresner and Windle 1999

Figure 1-14 Number of new jet carriers entering the industry and number exiting (or merging with others).

is Delta's Atlanta hub, from which it serves numerous business and leisure markets in the East, South, and Midwest. Spirit Airlines began operations out of Northwest's hub at Detroit Metro Airport. Though it has sought business traffic, Spirit now concentrates on serving leisure markets—for instance, by offering direct service from Detroit, New York (Newark, LaGuardia, MacArthur Field), and Chicago to vacation destinations such as Myrtle Beach, Atlantic City, and Florida.

Vanguard Airlines has taken a different approach by establishing its base in Kansas City, a spoke for most hubs, but concentrating service in nonstop hub routes (e.g., Minneapolis, Chicago, and Dallas). American Trans Airlines operates largely from Indianapolis and Chicago's Midway Airport, serving business markets such as Dallas, Philadelphia, and New York (LaGuardia). Eastwind Airlines, founded in 1992, has moved its base operations to Greensboro, North Carolina, and flies to business centers in the Northeast (Boston, New York, Philadelphia, and Pittsburgh), as well as to Florida. Midway Airlines, which began its operations in 1993 from Chicago's Midway Airport, has adopted American Airlines' former hub at Raleigh-Durham International Airport and focuses its operations on East Coast markets. Midway is service-oriented, marketing its wide, leather seats, and seeks to attract business travelers in a manner similar to the more established Midwest Express Airlines, which operates from Milwaukee.[21]

As discussed earlier, there was a sharp drop-off in industry and market entries in 1996, coinciding with the aftermath of the ValuJet crash. The extent to which this decline was a reaction to the accident and to the response by government regulators remains unclear. DOT slowed administration of its certification reviews for safety and fitness while reassessing its rules and processes, and it dismissed several applications for certification in 1997 and 1998. Undoubtedly, public concern over the safety of low-fare airlines and investor uncertainties about government regulatory reactions contributed to a decline in new airlines seeking entry. Nevertheless, even before the ValuJet crash, DOT had expressed

[21] However, Midway uses smaller regional jet aircraft than Midwest Express, which has a fleet of DC-9s.

concern that entry was being threatened by the unfair competitive practices of incumbent airlines, including "predatory behavior" (DOT 1996, 32). These allegations are examined in more detail in the next chapter.

Three years after the ValuJet accident, entry activity seems to be rebounding. From 1997 to 1998, several new low-fare airlines inaugurated service, including ProAir, centered in Detroit, and Access Air, based in Des Moines. ProAir, which began operations from Detroit City Airport in July 1997, has focused on attracting business travelers, scheduling short-haul flights between Detroit and other business centers such as Pittsburgh, Newark, Atlanta, Philadelphia, and New York LaGuardia. With financial backing from the Detroit-area business community, ProAir has signed multi-year agreements with General Motors Corporation and Daimler-Chrysler Corporation to provide air transportation for company employees and their families. AccessAir, formed in late 1998, is currently offering long-haul flights on B-737 aircraft from Des Moines and Moline, Iowa, to New York LaGuardia and Los Angeles. Like ProAir, AccessAir has financial backing from local businesses.

Several other airlines have applications pending with DOT or have been certified and have announced their intentions to start service in 1999, including Legend Airlines based in Dallas (Love Field), Sun Country Airlines in Minneapolis, and National Airlines in Las Vegas. A low-fare, short-haul airline temporarily known as New Air plans to operate from New York's JFK airport and has applied to DOT for take-off and landing slots beginning in late 1999.[22]

SUMMARY

During the 1990s, the airline industry has continued to evolve, still seeking a long-term equilibrium after 40 years of economic regulation that ended in 1978. Nonetheless, consumer gains from the deregulation of the industry have not eroded. From 1990 to 1998, average air fares fell by more than 25 percent, adjusted for inflation. Reductions in key production costs, including jet fuel, have contributed to this decline.

[22] Bringing New Air to New York. *Business Week*, May 3, 1999, pp. 182–184.

Spurred by these lower fares and costs, and boosted by a strong economy, passenger travel has increased along with airline profitability.

One reason for improved profitability is a growing spread in the fares paid during the 1990s. Travelers who paid the highest fares (the top 5 percent of fares) accounted for 15 to 20 percent of airline revenue in 1998, compared with 10 to 15 percent in 1992.

Some fare differentials can be attributed directly to costs—such as higher fares charged for flights during peak travel times, when resource constraints are highest and productivity can be lowest because of delays from congestion. Other markups, however, almost certainly are related to the high value of the service to some passengers—especially schedule-sensitive business travelers—and to the ability of airlines to identify these travelers and charge them higher fares. Nevertheless, these travelers may be made better off, on balance, by an airline's ability to price-discriminate, which allows it to cover the cost of providing more frequent flights. The concern is that the same condition that allows price discrimination—market power—also allows airlines to charge price-inelastic travelers fares that exceed cost.

In a deregulated environment, the main antidotes for excessive market power are assurances of free competitive entry coupled with prohibitions on behavior aimed at undermining the competitive process. Leading the way with regard to the former has been Southwest Airlines, which has entered scores of new city-pair markets during the 1990s. The airline industry also has experienced a resurgence in new airlines, particularly low-fare startups. Southwest and some other low-fare startups have focused on serving secondary airports in dense city-pair markets. These markets generally are less costly to serve than the busier main airports of metropolitan areas, which are prone to traffic congestion and other constraints that increase operating costs and serve as obstacles to entry.

However, many startup airlines have challenged incumbents at their hub airports, often producing lower fares for travelers. During the mid-1990s, low-fare carriers began service on hundreds of nonstop routes that previously had been dominated by hub carriers. The highly publicized crash of a jet operated by a low-fare carrier in 1996 coincided with a decline in both the number of startup airlines entering the industry and the expansion of these airlines into new markets. Moreover, this incident occurred when DOT began to suspect that major airlines were sup-

pressing low-fare competition by sharply reducing fares and then raising them again as soon as the competitor had left the market.

REFERENCES

ABBREVIATIONS

DOT	Department of Transportation
FAA	Federal Aviation Administration
GAO	General Accounting Office
TRB	Transportation Research Board

Bailey, E., D. Graham, and D. Kaplan. 1985. *Deregulating the Airlines*. MIT Press, Cambridge, Mass.

Borenstein, S., and N. Rose. 1994. Competition and Price Dispersion in the Airline Industry. *Journal of Political Economy*, Vol. 102, Aug., pp. 653–683.

Craun, J.M., and R. Bennet. 1993. *The Airline Deregulation Evolution Continues: The Southwest Effect*. Office of Aviation Analysis, Office of the Secretary, Department of Transportation, Washington, D.C.

DOT. 1996. *The Low Cost Airline Service Revolution.* Office of Aviation and International Economics, Office of the Secretary, Washington, D.C.

Douglas, G., and J. Miller III. 1974. *Economic Regulation of Domestic Air Transport: Theory and Policy*. The Brookings Institution, Washington, D.C.

Dresner, M., and R. Windle. 1999. *Resource Availability and New Entry in the U.S. Airline Industry*, prepared for TRB, April. Available from the authors and TRB.

FAA. 1998. *Aviation Forecasts: Fiscal Years 1998–2009.* Report FAA-APO-98-1, Office of Aviation Policy and Plans, U.S. Department of Transportation, Washington, D.C.

Gale, I.A., and T.J. Holmes. 1993. Advance–Purchase Discounts and Monopoly Allocation of Capacity. *The American Economic Review*, Vol. 83, pp. 135–146.

GAO. 1991. *Airline Competition: Weak Financial Structure Threatens Competition.* Report RCED-91-110. Washington, D.C., April.

GAO. 1997. *Aviation Safety: New Airlines Illustrate Longstanding Problems in FAA's Inspection Program.* Report RCED-97-2, Washington, D.C., Oct.

Gellman, A.J. 1971. Surface Freight Transportation. In *Technological Change in Regulated Industries* (W.M. Capron, ed.), Brookings Institution, Washington, D.C.

Levine, M.E. 1965. Is Regulation Necessary? California Air Transportation and National Regulatory Policy. *Yale Law Journal*, Vol. 74, July, pp. 1416–1447.

Meyer, J.R., M. Peck, J. Stenason, and C. Zwick. 1959. *The Economics of Competition in the Transportation Industries.* Harvard University Press, Cambridge, Mass.

Meyer, J.R., and C.V. Oster. 1984. *Deregulation and the New Airline Entrepreneurs.* MIT Press, Cambridge, Mass.

Meyer, J.R., and C.V. Oster. 1987. *Deregulation and the Future of Intercity Passenger Travel*. MIT Press, Cambridge, Mass.

Morrison, S.A., and C. Winston. 1995. *The Evolution of the Airline Industry.* The Brookings Institution, Washington, D.C.

Nethercutt, L.L., and S.W. Pruitt. 1997. Touched by Tragedy: Capital Market Lessons from the Crash of ValuJet Flight 592. *Economic Letters*, Vol. 56, pp. 351–358.

Ramsey, E.P.A. 1927. A contribution to the Theory of Taxation. *Economic Journal*, Vol. 37, March, pp. 47–61.

TRB. 1991. *Special Report 230: Winds of Change—Domestic Air Transport Since Deregulation*. National Research Council, Washington, D.C.