Airline Deregulation

Confronting the Paradoxes

Elizabeth E. Bailey

The deregulated airline industry abounds with paradoxes. The number of airlines has shrunk by more than half. But the degree of competition among carriers has, if anything, increased.

There are significant fare benefits to consumers. Yet, consumers find the complexity of fare structures a nuisance.

People talk as if they want more frills (less crowding, better meals, larger seats), yet when given those choices, they have picked the lower-priced services with the fewer frills. Indeed, if service is measured in flight frequency, consumers have gained even more in the service dimension than in the price dimension since deregulation.

Carriers have profoundly changed their core capabilities—in operations, in information systems, in marketing, and in pricing. Yet, to the traveler, a trip often seems pretty much the same today as it was fifteen years ago.

Most paradoxical of all is that while U.S. consumers seem discontent, people in the rest of the world view our air system with envy. Its strength has provided great benefits at home and is forcing major market adjustments among international carriers everywhere.

The New Core Capabilities

Hub-and-Spoke Route Systems. Deregulation freed up firms to focus on their own markets and operations. That focus produced new core operating capabilities. The old regulatory route regime was designed along railroad tracks, with initial route awards granted on linear east-west or north-south corridors. The route regime that has emerged under deregulation also has logic to it, but it is a logic derived from optimal flows in networks rather than from governmentally imposed linear systems. Operations research analysis showed that, if unconstrained by regulation, a hub-and-spoke delivery system was superior to a linear system. Consumers would be better off in terms of travel convenience and frequency of flights. Firms would be more efficient and would enjoy reduced delivery costs.

The hub-and-spoke delivery system has become the new standardized operating system for airlines. It has three central features. First, there are cost savings to airlines from better capacity utilization. Load factors are now in the low to midsixties, up from a level in the low to midfifties before deregulation. Second, there is greater concentration at the hub airport; one carrier tends to dominate operations by controlling 70 percent or more of incoming and departing flights. Hub concentration is believed to confer a degree of local market power on the serving carrier. A third feature is that more destinations are served nonstop from each hub. Several waves of incoming and departing flights occur each day. That greatly increases the number of sources and destinations between which passengers can flow with at most one intermediate stop.

The benefits of the new operating design to consumers are measured in a growth in weekly flights of 60 to 70 percent for large and medium cities

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and of 35 to 45 percent for small cities and rural or small communities. There is a benefit as well in the increase in city-pair competition (less than 50 percent of enplanements today take place on routes where a single carrier accounts for half or more of the passengers, compared with the 70 percent under regulation). One cost to consumers is somewhat higher prices that are paid in more concentrated hubs. Another cost of the new operating design is an increase in crowding and delays, particularly at the height of each wave of activity.

Computer Reservations and Yield Management Systems. Advances in computer technology, particularly with respect to the reservations systems, have expanded the industry's core capabilities. The computer reservations technology can be traced back to 1967, when American conducted an experiment in retail distribution by placing terminals in a small number of high-volume travel agencies. As late as 1976, American had installed its SABRE system in less than 150 travel agency offices. The systems were primitive compared with today's; they provided flight information and made reservations only for participating airlines. Today's systems quote fares, allow seat selection, and issue boarding passes and also provide car rental information and enable travelers to make hotel reservations. As system owners made greater investments in those systems and as computerized capabilities grew at an astounding rate, the systems revolutionized the face of air travel in the United States.

Only a few airlines provide these systems. The two largest systems, SABRE and APOLLO have a combined market share of 65 percent. SABRE has more than a 40 percent share of U.S. travel agents; APOLLO (United, now with significant foreign participation, as well as USAir) has nearly a 25 percent share. WORLDSPAN (Delta, Northwest, and TWA) and SYSTEM 1 (Continental) are the only other players, and their share is dropping. These systems provide economic rents to their carrier owners, but they also greatly improve service convenience for passengers. One such convenience, not included in most performance measures, is that passengers no longer have to wait in line for a half hour or more to get boarding passes at airports.

Strategic developments in pricing have also been made possible by computer hardware and software advances. Economists expected simple peak and offpeak pricing schemes. But such schemes can be driven out of the market by the more sophisticated yield management systems (price discrimination) that firms have produced. A pioneer in yield management systems, American had some 540,000 published fares before its recent effort to simplify fare structures. And those fares did not include numerous special deals. The intricate fare structure is driven by different supply and demand characteristics, such as the number of carriers serving the market and the mix of business and leisure travelers. Many restrictions apply, such as advance purchase requirements, nonrefundability provisions for many low fares, and Saturday night stays. Competition in price is so fierce that it is estimated that there are roughly 80,000 airline fare changes each day.

Airline deregulation freed up firms to focus on their own markets and operations. That focus produced new core operating capabilities: hub-and-spoke delivery systems and computer reservations and yield management systems.

The deregulated marketplace also enabled the industry to develop creative marketing schemes. After deregulation, a riot of new ideas flowered, most of which have been aimed at inducing brand loyalty. American introduced the frequent-flier program in 1981; within five years all airlines had adopted such programs. The program gives the traveler a free ticket after he has accumulated a certain number of miles on a particular airline (often 20,000 miles). Thus, the consumer, in making today's travel choice, will pick the airline that is his most likely choice for future travel. That airline is often the one with strong control at the originating hub airport in the consumer's neighborhood.

Airlines that own computer reservations systems enjoy other strategic advantages. For example, they can offer override commissions to travel agents who steer a sufficient volume of traffic toward them. Override commission programs involve a contract between the airline and a travel agent in which the airline agrees to increase the agent's commission rate if the agent reaches specified sales goals. Just as consumers have incentives to concentrate travel on one particular airline

because of the frequent-flier programs, so travel agents have incentives to concentrate bookings on particular airlines because of the override commissions they are offered.

Thus, the new operating, pricing, and marketing methods increase the focus on and rewards from the hub-and-spoke networks. Airline deregulation has enabled managers to enhance the role played by operations and production. Deregulation has also allowed managers to capitalize on innovations in pricing, marketing, and sales made possible by computer technology. Recently, it has been contended that deregulation has been responsible for freeing managers in a number of industries to discover new industry capabilities that enable the best managed firms to build market share.

Deregulation is also widely believed to have been responsible for the sharp decline in the number of carriers through merger, acquisition, and bankruptcy. But deregulation may not have been the major cause. Studies of many industries show that there is typically a proliferation of firms during the period of standardization that is followed by rapid consolidation.

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Researchers at the Massachusetts Institute of Technology have studied industry after industry, from the typewriter industry in the early 1900s to the electronic calculator industry of today. They find that there is typically a proliferation of firms during the period before standardization that is followed by rapid consolidation. Thus, the number of typewriter firms grew from about ten in 1893 to over thirty by 1896. After Hess's innovations and the dominant design of Underwood's model 5 in 1906, the number of firms shrank to a handful over the next two decades. Similarly, after the dominant design of the all-steel, closed body for the automobile was introduced in 1923, the number of firms participating in the industry dropped from eighty to less than twenty two decades later. The data on survival suggest that the probability of survival after the introduction of a dominant design is less than 50 percent over the next twenty years and less than 25 percent for as long as thirty years.

The airline industry would seem to fit into that pattern. The perception that structural change has been atypically great in the industry may be a result of its greater visibility. We are less aware of significant structural change in less visible industries, such as the typewriter or TV tube industry.

Industry Structure and Corporate Control

Bankruptcy and Exit. The market for corporate control of the airlines has been active since deregulation. The past fifteen years produced waves of bankruptcies, exits, mergers, and restructurings. And the market for corporate control has not yet equilibrated. Three of the remaining nine major players are in bankruptcy. And most of the U.S. airlines are now engaged in a fierce battle for control that transcends national boundaries. The international marketplace is now facing the realities of the new operating environment.

Consider the factors leading to the three most dramatic exits—those of Pan Am, Braniff, and Eastern. Pan Am was the pioneer of international aviation. In the regulatory era it had been awarded worldwide routes, but no domestic routes. Shortly after deregulation, it proceeded to rectify the situation by purchasing National Airlines. National seemed a good fit with its Miami location and offered a route network that naturally drew planes into the Pan Am hub at Kennedy Airport.

Pan Am failed at that merger, not because it lacked foresight or resources but because it poorly executed the merger. Pan Am's expertise was in delivering international operations where customers readily tolerated delays of an hour or more. It was unable to deliver a competitive degree of on-time performance when compared with domestic services of other U.S. carriers. It was unable to integrate its systems and its work forces effectively or to reequip and modernize its fleet. In the last

Table 1: The Market for Corporate Control

Airline	Market Share (percent) 1977	1984	1992 (Jan.)
Growth and Merger			
American	12.6	12.0	20.4
AirCal 1987			
TWA London Routes 1991			
Delta	9.7	8.9	17.7
Western 1987	4.3	3.1	
United	16.2	15.1	17.7
Pan Am Pacific Routes 1985			
Pan Am London Routes 1990			
Northwest	5.7	6.5	11.9
Republic 1980	2.2	2.8	
USAir	1.9	2.7	8.1
Pacific Southwest 1988	1.2	1.0	
Piedmont 1989	.6	2.0	
Southwest			
Muse 1981 (started), 1986	.3	1.5	2.8
Bankruptcy and Exit			
Continental	4.3	3.6	9.2
Texas International 1982			
New York Air 1980 (started), 1987			
Peoples Express 1981 (started), 1987		2.5	
Frontier 1985	1.0	1.5	
Eastern 1986 (exit 1990)	10.5	9.6	
TWA	12.2	9.3	6.2
Ozark 1986	.6	.9	
Pan Am (exit 1990)	8.9	9.2	.0
National 1980	3.2		
America West (started 1983)			2.9
Braniff (exit 1982, 1989)	3.8	.6	.0
All Other	.8	7.1	3.1
Total	100.0	100.0	100.0

decade of its operations, Pan Am lost more than $2 billion. It survived by selling off assets—the Pan Am Building in New York, the Intercontinental Hotel chain, land in Tokyo, and its routes to Japan and London. Once those were gone, the airline itself disappeared.

A similar explanation can be provided for the other instances of bankruptcy and eventual exit (see Table 1). The first bankruptcy, that of Braniff, came about because of a decision by its then chief executive officer, Harding Lawrence, to expand operations rapidly on a newly opened set of domestic and international routes. Operations on the new routes began with little advanced marketing or training of personnel. Lawrence believed that deregulation would be retracted and that Braniff would retain its new routes. When deregulation was codified into law, Braniff found itself with huge cash needs for operations (for example, for fuel) but insufficient cash flow (few customers). Again, its market failure stemmed from poor management strategy and execution.

Eastern's Chapter 11 filing and eventual exit followed a history of poor management practices—from uneconomic decisions on fleet at the time of Eddie Richenbacher to poor labor relations that haunted its last years of operations. Airlines such as TWA and Continental, which piled on debt in the late 1980s, have also found those decisions to be costly and have in turn been forced into Chapter 11.

The poor management performance has also been reflected in pay statistics. Under regulation there was no significant relationship between CEO pay and performance. Indeed, managers who performed poorly tended to receive higher pay. After deregulation, a statistically significant relationship has emerged that disciplined poor performers through lower real compensation. At Braniff, for example, the average annual CEO pay was $651,170 from 1971 to 1977; that was reduced to $262,018 in the period after deregulation, 1979 to 1984. In contrast, average CEO pay at Southwest Airlines rose from $249,161 to $498,941 over the same periods.

The marketplace is supposed to punish poor management, and it has done so in the aviation industry. Consumers remember the drama. They tend not to remember that the transition was smooth. The planes kept flying. Communities continued to be served. The reality has been that the failure of firms means that markets are working.

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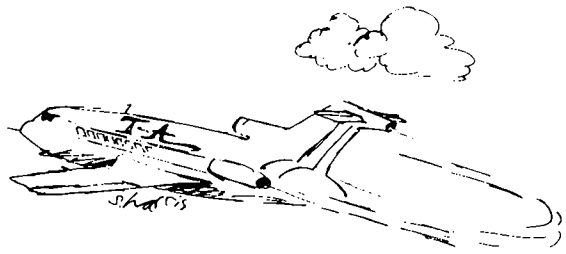
Growth and Merger. Contrast those failures in performance with some of the success stories. American provides a particularly apt example. In the years immediately following deregulation, American too found itself with a fleet of older aircraft, and it too had a profitability problem. In 1980 American took a number of steps to prepare



"This is your captain speaking. Transatlantic Airways has just been absorbed by Aero Argentina. Thus, instead of landing in London, we will touch down in Buenos Aires."

itself for the new, more competitive environment. It retired its 707s and began a phase-out of its 727-100s so that it reduced its capacity. In addition, management cut overhead costs by reducing the number of employees from 41,000 to 36,000. American also restructured its route system to build its hub-and-spoke connecting complexes and directed 79 percent of all traffic to Dallas/Ft. Worth, where it relocated its headquarters. Connecting flights to sunbelt growth areas replaced linear routes assigned under regulation.

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American also instituted new marketing and pricing strategies, including the frequent-flier program—a new concept involving wider spreads for discount (Supersaver) fares—and increased investment in its SABRE computer reservations system. American's new president, Robert Crandall, understood the implications of deregulation. He altered his methods of management down to detailed functional levels in his firm to prepare it for competitive success in the years ahead. Between 1976 and 1983, his firm trebled in market value to shareholders, and its market share and value have continued to grow.

Other large carriers got a slower start but also managed the adjustment. One of the last mergers was that of Delta with Western, but the well-regarded Delta management was able to minimize the array of operational and personnel problems associated with such mergers. United faltered in the earliest years in its strategic decisions and has had less success with labor relations than have American and Delta. Nevertheless, it was the first among the big three domestic carriers to see the logical push toward globalization.

The push to fewer and more global carriers comes from both the supply side and the demand side. High concentration is a natural result of the interaction between carriers' cost structures (efficiency) and passengers' schedule preferences (convenience). Passengers have contributed to the current structure through their choices. They have preferred low-frills service to upscale service. Their choice is evident from the failures of airlines attempting to offer first-class service at coach fares at St. Louis and Chicago. The choice is also evident from Southwest's success with its low-cost, point-to-point, turnaround services.

Consumers prefer to deal with a single carrier rather than to switch carriers. They believe that with a single carrier they face fewer hassles—lost baggage, missed connections, and poorly timed connections—associated with transferring from one carrier to another. Shortly after deregulation, the local carriers used their new route choice flexibility to initiate long-haul spokes from the hub cities endowed to them under regulation. Passengers remained on those carriers, despite their reputations. (USAir was called "Useless Air.") Such carriers had no first-class seats and an older, less attractive fleet. Yet, profits of the local service carriers from 1978 to 1984 were at financially healthy levels. The trunk carriers, on the other hand, found that offering only long-haul routes was a financial fiasco. Customers would not switch to them despite the amenities they offered. So to strengthen their own viability, the trunk carriers integrated backwards to capture the feeder networks that would give them a customer base on which they could rely. The disappearance of local service carriers has enhanced the economies of scope of their larger trunk rivals. Overall, the proportion of trips involving a change of plane has fallen from just over 11 percent in 1978 to just over 1 percent in 1990.

Economists have been critical of the antitrust policy that permitted some airline mergers, such as those of TWA and Ozark (which share the St.

Louis hub) and that of Northwest and Republic (which share the Minneapolis hub). A significant amount of literature has analyzed the effects of those mergers. But, even had government officials vetoed those mergers, there would have been failures (exits) due to poor financial performance, as for example, in the case of Ozark. Moreover, new economic studies of substitute product competition suggest that in situations where price can be varied at will, but changes in operations are not costless, there is a tendency for the number of firms to shrink toward a lower bound, and that firms with higher quality (greater scope of operation) will tend to dominate.

Globalization. More and more, consumers want the same single-carrier service they use domestically to take them to foreign cities. The consolidation movement evident on the U.S. scene in the 1980s is replaying itself on the international scene in the 1990s. The robust expansion of the deregulated airline industry in the United States has repercussions for foreign competition. Larger foreign carriers are buying into smaller carriers, for example, Air France into Sabena and SAS into Swissair and Austrian Airlines. Foreign-carrier groups increasingly coordinate flights into each others' hubs and purchase each others' equity. At the same time the privatization of foreign carriers (such as British Air and Japan Airlines) enables them to compete more efficiently.

The fascinating tale of the replacement of TWA and Pan Am by United and American at London's Heathrow Airport highlights the increasing strength of U.S. carriers abroad. The British, particularly British Airways, fiercely resisted replacing the U.S. carriers at that airport, precisely because they recognized the greater competitive strength of American and United vis-à-vis Pan Am and TWA.

International air service is not an area in which the United States is losing to Europe or Japan. By 1990 American and United had exceeded British Airways, the Air France Group, Lufthansa, and Japan Airlines in terms of rank by revenues. The United States has begun to put its best management forward. That is forcing major efficiency improvements around the world. It is also putting downward pressure on world price levels. A comparison of yield—the average dollars charged per revenue passenger mile—achieved domestically versus internationally shows that for every length of haul U.S. prices are lower. The longer the length of haul, the more U.S. prices are below world levels.

Perception versus Performance

The perception of airline deregulation is largely negative. Some of this negativity has roots in psychology. According to psychologists, people tend to overestimate any cause that is dramatic or sensational, such as the bankruptcy of an airline or a major air accident. On the other hand, people tend to underestimate the frequency of events that are common and unspectacular, such as an on-time air trip that the traveler planned enough in advance to obtain an attractive air fare. Media coverage magnifies the bias toward sensational events as it too focuses on catastrophes or violence.

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In air travel six or seven of ten trips may offer improvements in terms of either travel price or schedule convenience. Nevertheless, people tend to focus on the three or four of those ten trips where they have lost benefits, not on the larger number of trips where they have made gains.

People dislike change. Every year in January and February air fares go down, and every year in March and April fares go up. Rather than being pleased at the offpeak discount they receive during the winter, people react negatively each spring when the price goes back up. People like fairness and equity. They do not like having to pay an unusually high fare for tickets purchased at the last minute or learning that the passenger sitting next to them paid a lower fare. They are uncomfortable with discriminatory fares, even if overall fares are lower because of such pricing practices.

Table 2: Airline Performance Measures

Performance Measure	Assessed Gain (Loss) (billions of 1990 dollars)
Service	
Frequency Improvement	8.5
Travel Time Net Loss	(1.0)
Price	
Lower Average Fares	6.5
Travel Restrictions	(3.0)

Source: Winston (1992).

There are emotional attachments to a brand name (such as Pan Am or People's Express) that cause people to regret its disappearance and not to factor in potentially poor economic or strategic performance on the part of those airlines' managements. As a standard for low fares, it is also easier to use the remembered bargains of a People's Express than the higher fares of the period before deregulation.

Furthermore, people may blame airlines, and hence deregulation, for problems beyond the airlines' control. An obvious example is people's tendency to impute delays due to weather, inadequate air traffic control, or airport capacity shortages to the operating airline. The consumer remembers the particular airline on which he experienced the missed connection or other inconvenience and tends to blame to the airline (the visible party), rather than to the invisible causal party (the government) that might be truly responsible.

The airline industry, which was freed in the 1970s and 1980s from governmental intervention on rates and routes, increasingly in the 1990s must turn to government for international interventions and for infrastructure decisions on airports and air traffic control. Those areas have not been deregulated. It would be beneficial to take deregulation a step further.

Economists, in contrast, tend to neglect perception issues and focus instead on a few objectively measured performance characteristics. In terms of those characteristics, airline deregulation has exceeded its promises. Economists predicted price benefits in the range of $2.7 to $6.6 billion in 1990 dollars. As Table 2 shows, deregulation has produced benefits in exactly that range. Not everyone has gained, however. There are offsets to those price benefits from restrictions such as the Saturday night stay. Certain trips, such as those on monopoly routes or from concentrated hubs, have price premiums.

Economists felt there was likely to be no net improvement in service frequency; estimates ranged from $-.5 billion to $.5 billion. The reality has been that increased service frequency has yielded benefits that are even larger than those from pricing, even when the increased flight times for some trips are taken into account.

Moreover, the industry has not yet stabilized, as the recent fare wars have indicated. American recently adopted a price simplification scheme to increase its share of business customers. The vigor of the responses by Northwest and TWA indicates how vital the pricing issue is to them. Recently, the industry as a whole has had poor financial performance—with the new fare wars following immediately upon the recent recession.

Another paradox is that the industry, which in the 1970s and 1980s was freed from governmental intervention on rates and routes, increasingly in the 1990s must turn to government for international interventions and for infrastructure decisions on airports and air traffic control. Those areas have not been deregulated. It would be beneficial to take deregulation a step further.

The goal is to have airport operators charge efficient prices for takeoffs and landings and for operators and controllers to respond to market incentives for expansion. Privatization has been suggested. It might improve the current situation. But to do so, one would have to assume that the externalities conferred by airports to communities would serve to offset the natural monopoly aspect of airports. In the air traffic control area some residual regulation might be imposed to ensure that any governance change would not harm the excellent safety record to date.

There is no way to deregulate international aviation. But we could improve competition by changing U.S. rules on the foreign ownership of airlines and doing the same within Europe. If both U.S. and foreign carriers were given full access to each others' territories, travelers everywhere would benefit. In the absence of such policy changes, we are left with the paradoxes with which we started.

Conclusion

The new core capabilities airlines have adopted since deregulation have proved to be powerful tools for efficiency as well as for industry concentration. Benefits are so interlinked with technology that new rules to address the structural imperfections associated with hub-and-spoke route systems as well as price management and computer reservations systems would necessarily increase costs.

For consumers the perception persists that deregulation has been less successful than, in fact, it has been. There is a way for every real positive development to be cast so that it appears to be negative. It is natural for the media to portray the movement as being off-course. It is natural for consumers to remember their worst nightmare in terms of air travel price or service. It is unnatural and difficult to truly sort out the excellent overall performance from specific negative experiences.

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