Articles

Airline Deregulation and Public Policy

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An assessment of the effects of airline deregulation on travelers and carriers indicates that deregulation has provided travelers and carriers with $14.9 billion of annual benefits (1988 dollars). Airport congestion, airline safety, airline bankruptcy, and mergers are also analyzed and found in most cases to have reduced benefits. But, these costs should not be attributed to deregulation per se, but to failures by the government to pursue appropriate policies in these areas. Pursuit of policies that promote airline competition and efficient use of airport capacity would significantly increase the benefits from deregulation and would provide valuable guidance for other industries undergoing the transition to deregulation.

AFTER 40 YEARS OF TIGHT CONTROL BY THE FEDERAL government, domestic passenger airlines were deregulated in 1978. Under the Airline Deregulation Act, carriers—not the government—set fares and decide which markets to serve. Airline safety was not deregulated; the Federal Aviation Administration (FAA) continues to oversee this aspect of airline operations. Deregulation was initially popular with the public, primarily because fares declined. But publicized problems with airport congestion, airline safety, the recent wave of airline mergers, and the bankruptcy of Eastern Airlines caused the public to become uneasy. The initial public chorus of approval has been replaced by calls—in some quarters—for some form of reregulation.

It is our contention that a move toward reregulation would be misguided. The airline deregulation "experiment" has been a success. Current concerns with congestion, safety, mergers, and airline bankruptcy are either overstated or arise from failures by the government to pursue appropriate policies in these areas. Pursuit of policies that promote airline competition and efficient use of airport capacity would significantly enhance the benefits from deregulation and would provide valuable guidance for other industries undergoing the transition to deregulation.

Historical Setting

The first U.S. airlines carried mail, not passengers. Although the Post Office operated the first regular air mail service beginning in 1918, direct government involvement was always considered temporary and ended nominally in 1925 when Congress passed the Air Mail Act. Because passenger transportation was not profitable without a mail contract, the legislation effectively gave the Postmaster General control over entry into the industry. Thus "subsidized" passenger service began, with the Postmaster General as the "regulator" of commercial air transport.

Despite the Depression, aviation continued developing during the early 1930s because of significant technical advances in aircraft design and manufacturing (*1*). Between 1934 and 1938, with airlines seeking federal regulation to protect themselves from "excessive competition," Congress was continually considering legislation on economic regulation of air transport, eventually passing the Civil Aeronautics Act in 1938.

To implement the regulations, which remained basically unchanged until 1978, the act created what was to become the Civil Aeronautics Board (CAB). Not surprisingly, the powers given to that board reflected the nation's depression-era mistrust of unregulated competition. The Civil Aeronautics Act required a carrier wishing to serve a route to have a certificate of public convenience and necessity issued by the CAB. Carriers operating when Congress passed the act received "grandfather" rights and were granted certificates for the routes they served. Although the Board could not set fares directly, it did have the authority to approve or disapprove fares filed by carriers, basing its decisions on industry-wide costs. By not considering route-specific costs, the CAB's actions led to fares that were substantially higher than costs in many markets. Airlines were allowed to compete with service quality, most importantly flight frequency, which grew more fierce as aircraft technology, such as the introduction of jets during the 1960s, lowered seat-mile costs. Frequency competition was especially keen in long-distance markets where technological change dramatically reduced costs (*2*).

The CAB never allowed new airlines to enter major routes. They were also reluctant to allow existing carriers to enter routes served by another carrier if the incumbent objected that entry would divert traffic. As a result, the CAB never permitted entry on any route that already had two or more carriers until just before deregulation (*2*).

Carriers also needed CAB approval to discontinue service. In cases of bankruptcy, the CAB arranged "mergers of convenience," which "saved" failing carriers and also provided a way for healthy carriers to acquire route authority (*3*).

Following major bursts of technological change during the 1950s and 1960s that enabled carriers to operate efficiently at only a moderate size, more and more analysts asserted that unregulated competition was possible (*4, 5*). Thus, in addition to causing higher fares than a competitive market would produce, regulation was unjustified on technological grounds. Analysts based much of their argument about fares on the performance of intrastate airlines (primarily in California and Texas) that were exempt from CAB regulation. For example, in 1965 the intrastate carrier Pacific Southwest Airlines charged $11.43 between San Francisco and Los Angeles (350 miles) compared with $24.65 charged by CAB-

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certificated carriers between Boston and Washington, D.C. (409 miles) (*5*).

Such evidence during a decade of high inflation ultimately proved influential. In 1975 the Ford Administration sought deregulation of the airlines. Shortly thereafter, the CAB began loosening regulatory controls to the extent allowed by existing statutes, a trend that increased dramatically when economist Alfred E. Kahn was appointed chairman of the CAB in 1977. In October 1978, President Carter signed the Airline Deregulation Act.

The overriding objective of that act, reliance on competition, was achieved by gradually allowing carriers more freedom in pricing and in entry and exit. On 1 January 1983, all fare and entry regulations were eliminated except that carriers must be fit, willing, and able. Finally, on 1 January 1985, the CAB ceased to exist; its remaining functions—mergers, international aviation, and consumer protection—were transferred to the Department of Transportation. Airline safety regulation continued to be the FAA's responsibility.

Problems in Evaluating Airline Deregulation

A comprehensive evaluation of the effects of airline deregulation must overcome two fundamental methodological problems. First, because airlines need time to adjust to the new environment, the "before" and "after" periods should be several years apart. But the further apart the two periods are, the more likely changes in things like household income and fuel prices will cloud the analysis. Thus, one cannot simply compare fares or profits "before" and "after" and ascribe the differences to deregulation. What is required is a "counterfactual" analysis—a controlled experiment of sorts—in which, for example, the observed performance of regulated airlines in a given year is compared with a (counterfactual) projection of how deregulated airlines would have performed during the same year (*6*).

The second methodological problem is accounting for the effects of government policy in areas that affect the benefits of deregulation. Should deregulation be assessed given actual or optimal government policies? For example, deregulation caused large increases in air traffic that exacerbated airport congestion. Should this be considered a failing of airline deregulation or should it be attributed to the failure of airport authorities to adopt efficient congestion-based landing fees? The same problem arises with airline mergers. Some recent airline mergers appear to have raised fares. Should we attribute this to airline deregulation or to the airline merger-antitrust policy of the Reagan Administration? We argue that attributing these problems to deregulation is misleading and diverts attention from the primary objectives of government policy in the deregulated environment, which are to continue to promote competition and to make efficient use of public infrastructure.

Below, we discuss our assessment of airline deregulation before problems surfaced. Then we examine the relation between deregulation and the current issues of airport congestion, airline mergers, Eastern's bankruptcy, and airline safety.

Deregulation

Most of our findings are based on an analysis in which we compared the (actual) performance of 1977 regulated airlines with our (counterfactual) predictions of what deregulated fares, flight frequency, and travel time would have been in the 1977 economic environment (*7*). To predict 1977 deregulated fares, we estimated the relation between fares and factor prices (fuel and labor) for the deregulated period 1980 through 1982. Using this equation, we formed a fare deflator and applied it to a sample of fares for 812 routes in 1983. The results indicated that if airlines had been operating in a deregulated 1977 economic environment, actual industry-wide yield (revenue per passenger-mile) would have been 6.0 cents compared with the actual yield of 8.4 cents, an overall reduction in fares of nearly 30 percent.

Analysts expected fares would fall when the industry was deregulated, but frequency was also expected to decrease (*8*). Our findings show that departure frequency rose by 9.2 percent between 1977 and 1983 (*9*). The explanation is that the reduction in fares greatly stimulated travel and, at small cities, commuter airlines, offering more frequent departures with smaller planes, replaced major carriers. Most important, deregulation allowed and encouraged airlines' development of hub-and-spoke route structures, which increase departure frequencies. For example, in a simple network of five cities, it takes 20 (directional) nonstop flights daily to provide one nonstop flight between each city. Routing those same 20 flights through a hub gives each city two connecting flights daily to each of the other cities.

Our third finding was that average travel time increased by 5.4 percent (*10*). This increase was due to the circuity of hub-and-spoke routings and to increased airport congestion.

We calculated the annual monetary value travelers place on these fare, frequency, and travel time changes using a disaggregate intercity passenger demand model (*11*). The results indicate that the fare changes increased traveler welfare by $2.2 billion, the travel time changes reduced traveler welfare by $0.5 billion, and the frequency changes increased traveler welfare by $4.3 billion (all figures in 1977 dollars). Overall, travelers gained $5.7 billion (1977 dollars) or $10.4 billion when expressed in 1988 dollars (*12*). The majority went to business travelers because of their high value of the enhanced convenience of flying caused by the increase in flight frequency.

Deregulation's effect on the industry is also an issue. If, as many analysts now believe, regulation often benefits the regulated industry by allowing it to earn monopoly profits, airline deregulation should have reduced profits to carriers. But wasteful service competition eroded airlines' potential monopoly profits. Using data from 1981 through 1983, we estimated the relation between profits and such factors as the price of fuel, wages, and fares. We then estimated 1977 deregulated profits by plugging in 1977 values for fuel and wages and the estimated value of 1977 deregulated fares discussed above. Predicted deregulated profits exceeded actual regulated profits by $2.5 billion (1977 dollars) or $4.5 billion in 1988 dollars. Contrary to what many analysts and airline executives predicted, airlines as a group are better off because of deregulation (*13*).

How were such gains possible in the face of increased competition? By eliminating entry barriers, deregulation gave carriers the freedom to realign their routes and make more efficient use of capital and labor. It allowed them to adjust fares with market conditions. And the growth of capacity slowed allowing carriers to increase their productivity. Caves *et al.* (*14*) estimate that productivity improvements attendant with deregulation lowered 1983 airline costs by 10 percent compared with what they would have been had regulation continued.

Current Issues

Despite deregulation's benefits, the flying public has become uneasy as airports became more congested and flights endured annoying delays, as airline safety was seriously questioned in the wake of well-publicized accidents and so-called near-misses, and as fares rose—sometimes dramatically—in less competitive markets

(*15*). It was widely assumed that deregulation, rather than government policy in these areas, was the source of the problem. However, counterfactual analysis comparing air system performance under current versus optimal government policy shows not only that deregulation is largely free from blame, but that its benefits have been undercut by current policies.

Airport congestion. According to the FAA, additional passenger time and aircraft operating costs caused by congestion approach $5 billion annually. Furthermore, airport congestion may compromise safety and reduce competition by limiting entry. Critics blame airline deregulation for airport congestion. But airport congestion did not occur only in the deregulated era: the United States experienced an airport congestion crisis in 1968. Then, as now, the congestion problem largely existed because of a failure to price the use of, and make appropriate investments in, scarce runway capacity. The surge in traffic accompanying deregulation simply revealed long-standing flaws in runway pricing and investment policies.

For more than 40 years aircraft landing fees have been based on aircraft weight. By charging more to larger aircraft with a greater ability to pay, this system allowed airports to raise needed revenue without diminishing the use of the airport much. This made sense when airports were uncongested. Today, however, weight-based fees cause inefficient use of scarce runway capacity because they fail to reflect the costs—in the form of delay—that users impose on each other (*16*). The efficient solution is to assess takeoff and landing fees that equal the delay costs imposed on other users, plus the costs imposed on the airport, for example, runway maintenance. Congestion-based prices would significantly reduce the strain on airport capacity, eliminate the perceived need to limit flight operations, postpone expensive construction of new airports, and provide accurate market signals to determine when new investment is appropriate.

The effects of replacing weight-based fees with congestion-based fees are shown in Table 1 (*17*). Without building additional runways, congestion-based fees would generate significant benefits, totaling $3.8 billion per year (1988 dollars). These benefits are achieved through substantial increases in landing fees—more than tenfold at major congested airports—that leave users as a group worse off and airport authorities better off. These fee increases cause large reductions in airport use by general aviation and commuter airlines, especially during peak hours of the day. For example, at Washington National Airport landing fees (expressed per passenger) would increase to about $10 from less than $1. Use by airlines would decline by 8 percent, by 33 percent for commuter airlines, and by 52 percent for general aviation. Average delay would decline from 9 minutes to 5 minutes. (If congestion-based fees were accompanied by optimal expansion of runway capacity, the increase in landing fees would be far less and the delay savings far greater.)

Because an expansion in traffic causes a more than proportionate rise in delay, optimal pricing generates considerably higher benefits with the higher traffic volume of the deregulated environment. We assume that if regulation were still in effect, traffic volume at each airport would be 20 percent lower than under deregulation (*18*). Under this assumption, the annual benefits from optimal runway pricing total only $1.2 billion. Thus, failure to allocate airport capacity efficiently in response to the traffic induced by deregulation puts deregulation at a $2.6 billion disadvantage in comparisons of the regulatory environments.

Currently, airports receive federal support for "airside" improvements from the aviation trust fund, generated through an 8 percent tax on each ticket. But, in return, federal law limits the revenue airports can receive from landing fees. This subsidy-revenue limitation scheme is inappropriate for today's congested airports. What changes are appropriate? Because airports do not have an incentive to price efficiently under the current system, we recommend that government eliminate all subsidies to airports. With congestion-based pricing, landing fees alone would raise sufficient revenue for optimal investment without the need for subsidy. Thus, the government should relax or eliminate airports' revenue constraints (monopoly fees would still be prohibited) and reduce or eliminate the 8 percent ticket tax, which would compensate commercial passengers for any fare increases that result from higher landing fees.

The academic community has advocated congestion pricing for 20 years (*19*). The recent explosion of air traffic makes its adoption even more urgent, but, as in the past, there are political concerns (*20*). By responding to the public's plea for less delay there is now a basis for a political consensus that could make congestion pricing and thus an improvement in the deregulated air system's performance, a real possibility.

Airline mergers. Carriers' desires to merge are not new. What is new is the willingness of the government to approve mergers. Under regulation, the CAB disapproved mergers that would create a monopoly or harm other airlines. Consequently, the CAB often disapproved mergers that would have resulted in efficiency gains. They approved mergers primarily to rescue carriers in danger of bankruptcy. Under deregulation, the CAB (or since 1985, the Department of Transportation) does not consider the effect of the proposed merger on the profitability of other carriers. The authorities rely on potential competition (that is, the threat of entry) to discipline the market, rather than limiting themselves to assessing the merger's effect on actual competition (*3*). Thus, the authorities would likely approve a merger that would reduce the number of competitors on a route, as long as new competitors were free to enter. On the basis of these standards the Department of Transportation approved all eight mergers proposed since 1986.

Mergers provide both costs and benefits for travelers. The costs

Table 1. Annual economic effects of optimal runway pricing (1988 dollars) (*15*). [Adapted from (*15*)]

Affected component	Change relative to current practice (billions of dollars)*	
	Optimal pricing	Optimal pricing under "regulation"
Carrier operating costs	1.23	0.41
Passenger time costs	3.62	1.20
Landing fees	−11.58	−5.41
Passengers priced out of the market	−0.95	−0.41
Airport revenue and costs	11.50	5.36
Total	3.82	1.15

*Positive values indicate an improvement.

Table 2. Economic effects of airline mergers (1988 dollars) (*15*).

Merger	Total annual value (millions of dollars)*	
	Total	Total without frequent-flier effects
American and Air Cal	83.7	−0.3
USAir and Piedmont	−15.0	−38.8
USAir and PSA	−88.9	−98.0
Delta and Western	76.7	−124.4
Northwest and Republic	−11.7	−115.5
TWA and Ozark	34.3	−18.8
Total	79.1	−395.8

*Positive values indicate an improvement.

are largely from higher fares in those markets where competition is reduced. The benefits are from improvements in carriers' networks, such as more cities served and fewer connections and changes of planes (*21*). We quantified these effects on travelers' welfare for six mergers approved during 1986 and 1987. We used an airline carrier choice model to estimate the value that travelers place on changes in fares, frequency, travel time, and cities served caused by mergers (*15*). A merger's effect on these variables was predicted by various regression models. For example, our analysis indicates that a merger that decreases the number of carriers serving a route from two to one increases fares by about 11 cents a mile. If initially there were more than two carriers serving the route, the merger increases fares by about 1 cent a mile.

The results of our analysis are presented in Table 2. Three mergers reduce travelers' welfare and three improve it, with aggregate annual effects ranging from $83.7 million to −$88.9 million. Cumulatively, these mergers have a modest impact on travelers' welfare, raising it by roughly $79 million. The per-passenger effects of each merger are also small, on average less than $2.70. But the benefits from increased frequent-flier mileage and cities served are critical (*22*). If frequent-flier benefits and their costs from higher fares were eliminated, the mergers would lower annual welfare by approximately $395 million. But, although frequent-flier programs help justify some of the mergers, they also make it harder for new airlines to enter markets because they encourage brand loyalty. As strange as it may seem, taxation or elimination of frequent-flier programs could lead to more competition and lower fares, which might offset the loss of free trips.

Even if we ignore the frequent-flier benefits, these mergers offset only a fraction of our estimated $10-plus billion of annual benefits to travelers from deregulation. Consequently, our primary concern with mergers is their impact on deregulation's long-run performance. The mergers and the consequent restructuring of carriers' networks have virtually eliminated the possibility that progress can be made in achieving an optimal configuration of carrier competition. In a previous study (*7*) we found that welfare under deregulation fell short of the optimal level by $2.5 billion (1977 dollars). Although competition on high density routes is sufficient, on low density routes it is not. Mergers over the past few years have not eroded competition on high density routes enough to threaten deregulation's benefits, but by substantially foreclosing the possibility of increased competition on low to medium density routes, they have made it less likely that deregulation will reach its potential.

Bankruptcy. The bankruptcy of Eastern Airlines has added to concerns about competition under deregulation. But, even if Eastern does not emerge from bankruptcy, other carriers will enter Eastern's routes. How will this affect travelers? We used our model of mergers to estimate the impact on travelers of Eastern's permanent exit from its markets. If new entry only takes place on those routes where a carrier already serves both the origin and destination airports (but does not serve the route), passenger welfare will fall by about $100 million annually.

Although this loss is small compared with the gains travelers continue to receive from deregulation, one does wonder where new entry could come from if other carriers fail. An obvious source is foreign carriers. Allowing them to enter U.S. domestic routes would increase domestic competition as well as provide a quid pro quo for the entry of U.S. carriers in other countries. And it could pave the way for deregulation of international travel, which could provide substantial benefits to the flying public.

Airline safety. Safety was not deregulated. Nonetheless, concerns about safety have risen dramatically despite the continued decline in fatalities per passenger-mile since commercial aviation began. In the public's mind, the villain is deregulation. But, given the long-run trend, deregulation could have impaired safety only if it would have been even better had regulation continued. Analyzing this issue in a conceptually correct way is all but impossible: the appropriate question is, "How does safety under deregulation compare with what safety would have been under regulation, all else being equal?" The difficulty in answering this question is in predicting safety in a particular (counterfactual) environment. This requires controlling for weather and pilot error—the most important causes of accidents and the most difficult to model.

Table 3. Major contributors to fatal commercial air accidents, 1965–1986, (*15*).

Contributor	1965–1975		1976–1986	
	Accidents*	Order of importance	Accidents†	Order of importance
Pilot error	32	1	12	1
Weather	18	2	8	2
Traffic control	9	3	5	3
Aircraft/engine	7	4	4	4
Maintenance	2	5	1	6
Airport facilities	0	6	2	5

*Includes 42 accidents and 10 mid-air collisions. †Includes 15 accidents and 1 mid-air collision.

Table 4. Characteristics of pilots in fatal accidents (*15*).

Pilot characteristic	1965–75 average	1976–86 average
Age	44.95	47.40
Total flying hours	14,622	17,488
Flying hours in aircraft type in accident	2,481	4,329

An alternative approach is to investigate whether deregulation has affected the underlying causes of airline accidents. Critics charge that deregulated airlines will cut costs at the expense of safety. If so, one would expect to see a higher incidence of maintenance-related accidents or a reduction in the average age and experience of pilots involved in accidents. Table 3 reveals that, not only has deregulation not altered the relative importance of the causes of accidents, but there has even been a reduction in the number of fatal accidents despite increased aviation activity. Furthermore, maintenance-related accidents and mid-air collisions have fallen and, as Table 4 shows, pilots involved in accidents are older and more experienced (although these differences are not statistically significant). The causes of accidents, therefore, do not support the charge that deregulation has adversely affected the long-run safety trend.

What has been responsible for the downward trend in fatal accidents and how can this trend be maintained? Industry learning and the introduction of radar, jet aircraft, improved navigational and landing aids, and pilot training more closely aligned to actual life-threatening situations usually receive the credit. But these contributions should not disguise the mismanagement of air safety during deregulation. The number of controllers and inspectors has not kept pace with the growth of air travel, especially during the last few years. Despite congressional prodding that has increased the controller work force to 16,250, the number of controllers is still below levels in 1978, 1979, and 1980. The Advanced Automated (Air Traffic) System, which could help reduce weather-related and pilot error–induced accidents, is far behind schedule and over-budget, and the FAA still does not have a centralized and systematic approach to improve flight crew performance. The FAA must therefore develop a more focused approach to managing air safety or face the possibility of its decline.

Lessons and Conclusions

Despite problems during the regulatory transition, the evidence that airline deregulation has produced significant gains for society is overwhelming. This conclusion has been reached by evaluating airline deregulation itself, isolating the effects of the macroeconomy and related government policies. If appropriate policies are pursued, deregulation's benefits will be even greater. These policies include congestion pricing at airports, promotion of entry by foreign carriers, and improved air safety management.

Current debates over the desirability of complete deregulation of railroads, motor carriers, telecommunications, and banks are heavily influenced by the airline debate. From a methodological perspective, we have shown the importance of carrying out a counterfactual analysis to isolate the effect of deregulation on consumers and firms and to identify how related government policies affect performance. The major policy lessons we draw from the airline case are that there are specific constructive steps that policymakers can take to enhance performance in a deregulated environment. Policy directed to the other industries might follow the guidelines set out here in order to promote competition and make efficient use of infrastructure. Failure to take such steps can provide an unjustified opening for advocates of reregulation. Misguided debates will be avoided if these lessons are learned.

REFERENCES AND NOTES

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3. ———, D. R. Graham, D. P. Kaplan, *Deregulating the Airlines* (MIT Press, Cambridge, MA, 1985).
4. See, for example, L. S. Keyes, *Federal Control of Entry into Air Transportation* (Harvard Univ. Press. Cambridge, 1951); R. E. Caves, *Air Transport and Its Regulators: An Industry Study* (Harvard Univ. Press, Cambridge, MA, 1962).
5. M. E. Levine, *Yale Law Rev.* **74**, 1416 (1965).
6. Newspapers implicitly present simple counterfactual models when they compare, for example, the increase in fares since deregulation with the rate of general price inflation as measured by the Consumer Price Index (CPI), attributing any difference in deregulation. However, such simple models are potentially misleading because they assume that without deregulation air fares would have risen at the rate of general price inflation.
7. Results are described in more detail by S. Morrison and C. Winston [*The Economic Effects of Airline Deregulation* (Brookings Institution, Washington, DC, 1986)].
8. See G. W. Douglas and J. C. Miller III, *Economic Regulation of Domestic Air Transport: Theory and Policy* (Brookings Institution, Washington, DC, 1974).
9. This is not a counterfactual comparison. However, the factor price changes between 1977 and 1983 (especially the increase in fuel prices) would, by themselves, have led to reduced flight frequency (as well as increased travel time). Thus the change in flight frequency presented here understates the change that a more complicated counterfactual model would have attributed to deregulation.
10. This is not a counterfactual comparison (*9*).
11. The demand model is from S. A. Morrison and C. Winston [*Res. Trans. Econ.* **2**, 213 (1985)].
12. The $5.7-billion aggregate welfare change does not equal the sum of its components due to rounding error and the non-linearity of the welfare change measure. This figure is inflated to 1988 dollars with a GDP (gross domestic product) inflator.
13. This conclusion is corroborated by J. A. Gomez-Ibanez, C. V. Oster, and D. H. Pickrell [*J. Policy. Anal. Manage.* **3**, 74 (1983)] and by T. G. Moore [*J. Law Econ.* **29**, 1 (1986)].
14. D. W. Caves, L. R. Christensen, M. W. Tretheway, R. J. Windle, in *Public Regulation: New Perspectives on Institutions and Policies*, E. E. Bailey, Ed. (MIT Press, Cambridge, MA, 1987), pp. 285–320.
15. There has also been concern in some quarters with the anticompetitive effects of computer reservation systems and the possible inequities from price discrimination. S. A. Morrison and C. Winston [*Brookings Papers on Economic Activity, Microeconomics 1989* (1989), p. 61] were unable to find any effect of computer reservation systems on passengers' choices of airlines. The practice of price discrimination frequently benefits all classifications of travelers. For example, under competition, coach fares would be higher if carriers were not allowed to also charge discount fares. Similarly, "discount" fares would be higher if carriers were not allowed to also charge coach fares.
16. S. A. Morrison, *J. Pub. Econ.* **34**, 45 (1987).
17. A possible alternative to the landing fee solution proposed here is a "slot" system in which airports sell the right to takeoff and land to airport users. Airlines could subsequently sell or trade these slots. However, S. Borenstein [*Q. J. Econ.* **103**, 357 (1988)] has argued that a market allocation of slots will not ensure efficiency.
18. This (conservative) assumption is based on our earlier finding that deregulation led to fares that were at least 25 percent lower than they would have been under regulation and that the trip-generation price elasticity is 1.0.
19. M. E. Levine, *J. Law. Econ.* **12**, 79 (1969).
20. These concerns include the effect of pricing on (i) small community service, (ii) transfer of larger carrier rents to airports, and (iii) general aviation. However, to the extent that carriers optimize their networks and schedules in response to congestion pricing and airports make optimal investments in runway capacity, small community service and larger carriers are not likely to be seriously harmed. General aviation could still be harmed and a political compromise may have to be reached whereby their fee increase is less than what is called for under optimal pricing.
21. Although mergers sometimes create dominant hubs that result in high fares for travelers traveling to or from the hub, other travelers benefit because that carrier-hub competes for connecting passengers with other carriers and hubs.
22. Our airline carrier choice model indicates passengers prefer carriers that offer more frequent-flier miles and that serve more cities. A merger increases the number of cities served by the merged carriers and thus benefits frequent fliers by affording them a wider choice of destinations for their free trips.

23. We would like to thank B. Szittya for valuable help with exposition and two anonymous referees for helpful comments.