

Using the Price System to Reduce Airport Congestion

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Driven by the growth in demand, flight volumes at many major U.S. airports have increased sharply in recent years. Since airport flight capacity has hardly changed, the increase in traffic volumes has led to more and longer delays. In 2007, 24 percent of flights arrived late, up from 15 percent in 2003.

What measures are appropriate for handling airport congestion? Building more capacity is one option, and some expansion will surely be needed despite its high cost. Another is to cut flight volumes through direct government intervention in airline scheduling decisions. A more systematic approach relies on a “slot” system, where airlines cannot schedule flights as they please but must instead acquire landing or take-off slots, issued by the airport. “Slot constraints” have been used at four major U.S. airports and are de rigueur in Europe.

Quantity controls, however, do not guarantee that available slots are used effectively. For example, airlines may use peak-hour slots to operate smaller aircraft than would be desirable. While slot trading helps to achieve the highest and best use of slots, frictions in the trading process may still leave room for inefficiencies.

A better way to ensure efficient use of scarce runway capacity is to rely on the most basic economic pricing principle: make airlines pay the marginal cost of using a congested airport. If an airline decides to land under congested conditions, it incurs extra operating costs while subjecting its passengers to additional time costs, and it will take both of these costs into account. But the presence of congestion means the extra flight also increases operating and time costs for all other flights using the airport, and these impacts are also part of marginal cost. A condition for efficient use of congested runway capacity is that the full marginal cost, including the cost imposed on other airlines, must be internalized (taken into account) by the carriers.

But would an airline in fact internalize these costs in deciding whether to operate an extra flight? This question has been much debated among airline economists, leading to the usual answer: “it depends.” If each airline serving the airport has a relatively large presence, operating a substantial number of flights, then each carrier will

understand that its scheduling decisions affect the overall level of congestion. Moreover, carriers will play a scheduling game, with each airline setting its flight volumes to maximize profit, taking account of airport congestion as well as scheduling choices of the other carriers. In this situation, each airline will partially internalize congestion, taking into account the congestion it imposes on itself (additional delays for all its other flights) in deciding whether to schedule an extra flight. However, since the airline will ignore the congestion imposed on other carriers, marginal costs are only partially internalized.

The answer to the internalization question is even less favorable when the big players at the congested airport coexist with a competitive fringe, namely, airlines that operate only a few flights. Rather than being equal players, the fringe carriers follow the lead of the big airlines, adjusting to their behavior while having no individual impact on the overall level of congestion.

In the presence of a competitive fringe, partial internalization of congestion is eliminated. If large carriers restrict their flight volumes, the fringe carriers would simply fill the gap. Therefore, each big carrier’s incentive to take account of self-imposed congestion is neutralized. The Federal Aviation Administration observed exactly this kind of “gap-filling” behavior after convincing United and American Airlines to cut their flight volumes at O’Hare Airport.

Since internalization of congestion is either partial or nonexistent in these two cases, policy intervention is required. Congestion pricing, which makes airlines pay for the congestion they fail to internalize, is an attractive option. Joseph Daniel (1995) calculated congestion charges for the Minneapolis–St. Paul airport, assuming that the competitive fringe model is realistic. He found that the congestion charge for each flight should equal about \$1,000 (in 2007 dollars)

on average during the day. But once the charges have spurred airlines to shift flights to off-peak hours, the average charge would fall to about \$360. With partial internaliza-

tion, congestion charges would have somewhat smaller magnitudes. Regardless of which case applies, some level of congestion pricing would be required at most large airports.

Unlike pouring concrete for more runways, congestion pricing is virtually costless to implement, and by reducing peak traffic volumes, it will make our airports seem magically larger. While airlines strongly oppose congestion pricing, the industry seems not to recognize that congestion charges can replace the current weight-based system of landing fees. With fees dropping to zero in off-peak hours, reflecting the absence of congestion, the carriers’ overall costs need not rise by much. In any case, peak-hour congestion charges are likely to be passed on to passengers, widening the current differential between peak and off-peak fares and generating the traffic shift toward less-congested hours. ■

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