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Flying the Friendly Skies?

Most of us hop into our car with little thought for our personal safety, beyond perhaps the act of putting on seat belts. Yet even though travel on scheduled, commercial airlines is safer than driving to work or to the grocery store, many people approach air travel with a sense of foreboding, if not downright fear.

If we were to think carefully about the wisdom of traveling 600 miles per hour in an aluminum tube seven miles above the earth, several questions might come to mind: How safe is this? How safe should it be? Because the people who operate airlines are not in it for fun, does their interest in making a buck ignore our interest in making it home in one piece? Is some form of government regulation the only way to ensure safety in the skies?

The science of economics begins with one simple principle: We live in a world of **scarcity,** which implies that to get more of any good, we must sacrifice some of other goods. This is just as true of safety as it is of pizzas or haircuts or works of art. Safety confers benefits (we live longer and more enjoyably), but achieving it also entails costs (we must give up something to obtain that safety).

As the degree of safety rises, the total benefits of safety rise, but the marginal (or incremental) benefits of additional safety decline. Consider a simple example: Adding exit doors to an airplane increases the number of people who can escape in the event of an emergency evacuation. Nevertheless, each *additional* door adds less in safety benefits than does the previous one; if the fourth door enables, say, an extra ten people to escape, the fifth may enable only an extra six to escape. (If this sounds implausible, imagine having a door for each person; the last door added will enable at most one

more person to escape.) So we say that the marginal (or incremental) benefit of safety declines as the amount of safety increases.

Let's look now at the other side of the equation: As the amount of safety increases, both the total and the marginal (incremental) costs of providing safety rise. Having a fuel gauge on the plane's instrument panel clearly enhances safety, because it reduces the chance that the plane will run out of fuel while in flight.[1] It is always possible that a fuel gauge will malfunction, so having a backup fuel gauge also adds to safety. Because having two gauges is more costly than having just one, the total costs of safety rise as safety increases. It is also clear, however, that while the cost of the second gauge is (at least) as great as the cost of the first, the second gauge has a smaller positive impact on safety. Thus, the cost per unit of additional (incremental) safety is higher for the second fuel gauge than for the first.

How much safety should we have? For an economist, the answer to such a question is generally expressed in terms of marginal benefits and marginal costs. The economically *efficient* level of safety occurs when the marginal cost of increasing safety just equals the marginal benefit of that increased safety. Put somewhat differently, if the marginal benefits of adding (or keeping) a safety feature exceed the marginal costs of doing so, then the feature is worth it. But if the added benefits of a safety device do *not* exceed the added costs, we should refrain from installing the device. Note there are two related issues here: How safe should we *be,* and how should we *achieve* that level of safety?

Both of these issues took on added urgency on the morning of September 11, 2001, when terrorists hijacked four U.S. commercial jetliners. The hijackers deliberately crashed two of the planes into New York's World Trade Center and flew another into the side of the Pentagon. The fourth plane crashed in a Pennsylvania field, probably in the midst of a struggle for control between the passengers and hijackers. Most people were stunned with the ease with which the hijackers were able to carry out their mission, for it suggested that air travel, particularly in the United States, was far less

[1] Notice that we say "reduces" rather than "eliminates." In 1978 a United Airlines pilot preoccupied with a malfunctioning landing gear evidently failed to pay sufficient attention to his cockpit gauges. Eight people were killed when the plane was forced to crash land after running out of fuel.

safe than previously believed. Immediately, it was clear that we should devote additional resources to airline safety; what was not clear was how *much* additional resources should be thus devoted, nor precisely *what* changes should be made. For example, some airline pilots wanted the right to carry firearms on flights, to help them prevent future hijackings. Other people objected, noting the high potential costs of such an action: an errant shot from a pistol could puncture a plane's skin, resulting in catastrophic cabin depressurization. Similarly, almost everyone agreed that more careful screening of passengers (and baggage) at airports would produce important safety benefits. But again, the question arose: how should we achieve this? Should carry-on bags be prohibited, or just examined more carefully? How thoroughly should checked luggage be screened for bombs? Our answers to these questions are evolving as we learn more about the extent of the threat and the costs of alternative responses to it. Nevertheless, throughout the process, economic principles can help us make the most sensible decisions.

In general, the efficient level of safety will not be perfect safety, because perfection is simply too costly to achieve. For example, to be absolutely *certain* that no one is ever killed or injured in an airplane crash, we would have to prevent all travel in airplanes. This does not mean it is efficient to have air disasters become a daily feature on the evening news. It does mean that it is efficient for there to be *some* risk associated with air travel. The unavoidable conclusion is that if we wish to enjoy the advantages of flying, we must be willing to accept some risk—a conclusion that each of us implicitly accepts every time we step aboard an airplane.

Changes in circumstances can alter the efficient level of safety. For example, if a technological change reduces the costs of bomb-scanning equipment, the marginal costs of preventing terrorist bomb attacks will be lower. It will be efficient to have more airports install the machines, and to have extra machines at large airports to speed the screening process. Air travel will become safer because of the technological change. Similarly, if the marginal benefits of safety rise for some reason—perhaps because the president of the United States is on board—it could be efficient to take more precautions, resulting in safer air travel. Given the factors that determine the benefits and costs of safety, the result of a change in circumstances will be some determinate level of safety that generally will be associated with some risk of death or injury.

Airplanes are complex systems, and an amazing number of things can go wrong with them. Over the century that humans have been flying, airplane manufacturers and airlines have studied every one of the things that has gone wrong thus far and have put into place design changes and operating procedures aimed at preventing recurring error. Of course, consumers have the greatest incentive to ensure that air travel is safe, and if information were free, we could assert with some confidence that the actual level of safety supplied by firms was the efficient level of safety. Consumers would simply observe the safety offered by different airlines, the prices they charge, and select the degrees of safety that best suited their preferences and budgets—just as with other goods. But, of course, information is not free; it is a **scarce good,** costly to obtain. As a result, it is possible that passengers are unaware of the safety records of various airlines, or the competency of the pilots and the maintenance procedures of an airline's mechanics. Indeed, it is possible that even the airlines themselves are uncertain about the efficient level of safety, perhaps because they have no way of correctly estimating the true threat of terrorist attacks, for example. Both of these possibilities have been used to argue that it is appropriate for the federal government to mandate certain minimum levels of safety, as it does today through the operation of the Federal Aviation Administration (FAA). Let's look at this issue in some detail.

One argument in favor of government safety standards rests on the presumption that, left to their own devices, airlines would provide less safety than passengers actually want to have. This might happen, for example, if customers could not tell (at a reasonable cost) whether or not the equipment, training, procedures, and so on employed by an airline are safe. If passengers cannot cheaply gauge the level of safety, they will not be willing to reward airlines for being safe or punish them for being unsafe. If safety is costly to provide and consumers are unwilling to pay for it because they cannot accurately measure it, airlines will provide too little of it. The conclusion, at least as reached by some, is that government experts—such as the FAA—should set safety standards for the industry.

This conclusion seems plausible, but it ignores two simple points. First, how is the government to know what the efficient level of safety is? Even if the FAA is fully knowledgeable

regarding the efficacy and costs of all possible safety measures, it still does not have enough information to set efficient safety standards, because it does not know the value that people place on safety. Without such information, the FAA has no way of assessing the benefits of additional safety, and thus no means of knowing whether those benefits are greater or less than the added costs.

The second point is that it is likely that what people are really interested in is reaching their destinations safely, not whether they got there because of a good plane, a good pilot, or a good mechanic. Even if they cannot observe whether an airline hires good pilots or bad pilots, they can observe whether that airline's planes land safely or crash. If it is *safety* that is important to consumers—and not the obscure, costly-to-measure set of reasons for that safety—the fact that consumers cannot easily measure metal fatigue in jet engines may be totally irrelevant to the process of achieving the efficient level of safety.

Interestingly, evidence shows that consumers are indeed cognizant of the safety performance of airlines, and that they "punish" airlines that perform in an unsafe manner. Researchers Mark Mitchell and Michael Maloney have found that when an airline is "at fault" in a fatal plane crash, consumers appear to downgrade their safety rating of the airline (i.e., revise upward their estimates of the likelihood of future fatal crashes). As a result, the offending airline suffers substantial adverse financial consequences over and above the costs of losing the plane and being sued on behalf of the victims. These research findings suggest a striking degree of safety awareness on the part of supposedly ignorant consumers.

Of course, this discussion leaves open the issue of how to handle safety threats posed by terrorists and the like. For example, much of the information that goes into assessing terrorist threats is classified as secret, and its revelation to airlines or consumers might well compromise key sources of the data. Hence there could be an advantage to having the government try to approximate the efficient safety outcome by mandating certain screening provisions without revealing exactly why they are being chosen. Similarly, because airlines are connected in networks (so that people and baggage move from one airline to another in the course of a trip) one might argue that achieving the efficient level of safety necessitates a common set of screening rules for all airlines.

Even so, this does not inform us as to whether the government should impose those rules, or the airlines should come to a voluntary joint agreement on them.

We began this chapter with the commonplace observation that airlines are safer than cars. Yet many people still worry for their safety every time they get on an airplane. Are they being irrational? Well, the answer, it seems, is in the eye of the beholder. Measured in terms of fatalities per mile traveled, airplanes are some 15 times safer than cars (and 176 times safer than walking, we might add). But this number masks the fact that 68 percent of aircraft accidents happen on takeoff and landing, and these operations occupy only 6 percent of flight time. It is presumably this fact that quite sensibly makes people nervous whenever they find themselves approaching an airport.

DISCUSSION QUESTIONS

1. Is it possible to be too safe? Explain what you mean by "too safe."
2. Many automobile manufacturers routinely advertise the safety of their cars, yet airlines generally do not even mention safety in their advertising. Can you suggest an explanation for this difference?
3. Many economists would argue that private companies are likely to be more efficient than the government in operating airlines. Yet many economists would also argue that there is a valid reason for government to regulate the safety of those same airlines. Can you explain why (or why not) the government might be good at ensuring safety, even though it might not be good at operating the airlines?
4. Professional football teams sometimes charter airplanes to take them to their "away" games. Would you feel safer riding on a United Airlines plane that had been chartered by the Washington Redskins than on a regularly scheduled United Airlines flight?