
Currents

Welcome

Careful readers will notice a new name on our masthead. Our new senior editor and Cato's new director of regulatory studies is Brink Lindsey. Brink is a lawyer, a graduate of Princeton and the Harvard Law School, and had made a substantial reputation defending innocent people against bad trade law. We were fortunate to convince him that it is more important to change bad law and that Cato is the most promising institution to serve that noble objective. Economists and lawyers have a lot to learn from each other, and we look forward to a productive relationship.

Catherine England will continue to write for us on occasion (as in this issue). To Catherine, best wishes. To Brink, welcome.

W.N.

A Line in the Sand?

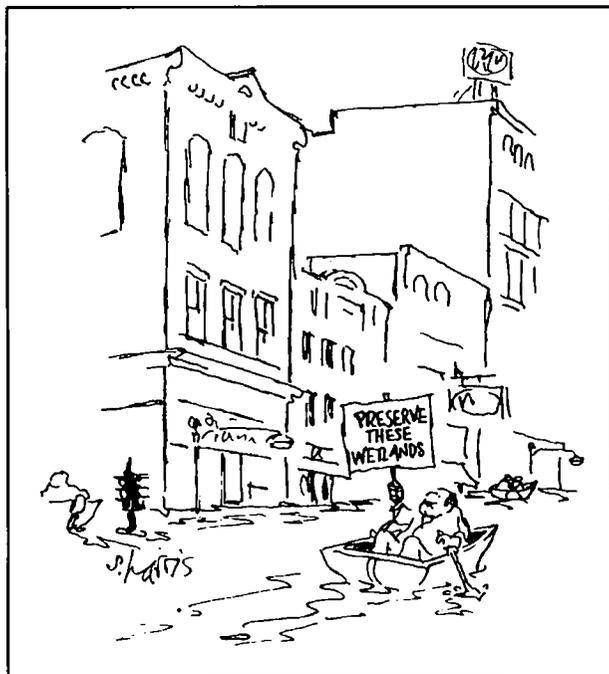
In the recent case of *Lucas v. South Carolina Coastal Council*, the Supreme Court had the opportunity to clarify the confusing and arbitrary body of law affecting regulatory takings of private property. Unfortunately, the Court did not. The opinion of the Court, delivered by Justice Antonin Scalia (a former editor of *Regulation*) may not protect any property owner, including Mr. Lucas, against regulations that substantially reduce the value of his property, and it reinforces a modern confusion between regulations that reduce harm and those that confer benefits on other parties.

The facts of the case are clear. David Lucas, a developer, purchased two lots on a barrier island east of Charleston, South Carolina, in 1986 for a total price of \$975,000. The lots were zoned for single-family houses and were adjacent to existing houses; no special permit would have been

required at that time to develop those lots. In 1988 the South Carolina legislature enacted a Beachfront Management Act, one effect of which was to prohibit Lucas from building any permanent habitable structures on his lots. Contending that the prohibition of new development was a taking of his property without compensation, Lucas promptly filed suit. The trial court found that the development ban made the Lucas lots "valueless" and awarded compensation of about \$1.2 million. In 1990, as this case was being reviewed by the Supreme Court of South Carolina, the legislature amended the Beachfront Management Act to authorize the issuance of special permits on an exceptional basis, a measure that may yet permit Lucas to develop his lots, but the court proceeded to decide the *Lucas* case on its merits. That court reversed the trial court and denied compensation because Lucas had not challenged the validity of the Beachfront Management Act. Lucas appealed the decision to the Supreme Court of the United States. The Court accepted the case in 1991 and released its opinion on June 29, 1992.

A majority of the Court was clearly eager to decide the *Lucas* case. They could have declined to accept it on several conventional grounds, including that Lucas had not exhausted all of his legal remedies before the South Carolina Coastal Council and the lower courts and that the record of prior decisions did not provide sufficient evidence to determine whether the development ban had eliminated all economic value of the Lucas lots. The presumed reason to accept the case was to clarify the law bearing on regulatory takings. That is the reason that both the opinion and the reasoning of the Court are so disappointing.

Scalia's opinion creates both a new categorical standard and a confused exception to that standard. The new categorical standard is that property owners must be compensated if some new regulation "denies *all* economically beneficial or productive uses of land" (emphasis added). The confused exception is the case in which the new regulation is consistent with the "background



principles of insurance and property laws.” There are several problems with both the standard and the exception.

The Court, as is characteristic, defended the new standard in terms of the precedent of prior cases, in this case a set of recent cases that date from *Agins v. Tiburon* (1980). The *Agins* standard, however, is that a new regulation effects a taking if it “denies an owner economically viable use of his land.” The new standard *reduces* the scope of the *Agins* standard to those regulations that deny *all* such uses. There are several severe problems with the new standard:

- The *Agins* standard may have been developed to require compensation in cases in which a new regulation leads to a substantial but not complete loss of economic value; the new standard provides no guidance as to whether compensation is required in such cases.
- The language of the opinion is ambiguous as to whether the test of complete taking is the elimination of any market value of the property or the prohibition of specific uses of the property. In the former case, the new categorical standard may not protect any property owner, possibly including even *Lucas*, or apply to any known regulation; few if any regulations, probably including that affecting *Lucas*, reduce the value of the affected property to zero.

On the other hand, other language suggests that regulations that require “land to be left substantially in its natural state . . . carry with them a heightened risk that private property is being pressed into some form of public service under the guise of mitigating serious public harm” and may require compensation. Any value of the *Lucas* opinion in requiring compensation for regulatory takings, for example, to protect wetlands or the habitat for endangered species, would be dependent on that interpretation of the test of a complete taking.

For that standard a market-value test of a complete taking is precise but would probably protect no property owner. In contrast, a test based on the scope of prohibited uses may provide substantial protection, but the Court does not define the set of uses for which their prohibition would require compensation. And the Court is not clear about whether a complete taking would be based on one or the other of those two tests.

The language of the exception, based on the “background principles of nuisance and property law,” suggests a clear test. One might hope that this means that compensation (in the event of a complete taking) would not be required only if the new regulation is redundant, that is, it does not change the owner’s bundle of rights at the time of this regulation. That would be an acceptable exception if the owner had a reasonable basis for understanding the bundle of rights that would be protected against an uncompensated taking.

Scalia, however, observes that “the property owner necessarily expects the uses of his property to be restricted, from time to time, by various measures newly enacted by the State in legitimate exercise of its police powers.” Moreover, Scalia has an expansive concept of the police powers that endorses the precedent of a recent set of cases dating from the *Penn Central* case (1978) that broadens the police powers from regulations that reduce harm to those that secure benefits to others. Is the *Penn Central* principle to be considered a part of the “background principles of nuisance and property law”? If so, there may be no limits to the exception under which no compensation is required. For an economist with no legal training, the failure to distinguish between regulations that reduce harm and those that secure benefits defies both the history of nuisance law and common sense. Justice Blackmun seems to agree, observing (in dissent) that “[i]f judges in the 18th and 19th centuries can distinguish a harm from a benefit,

why not judges in the 20th century, and if judges can, why not legislators?" If the law does not now distinguish between a harm and a benefit, the law is an ass!

In summary, what is the status of takings jurisprudence after *Lucas*?

- The Court has long required "just compensation" in the event of a complete permanent physical taking of real property.
- Recent cases have broadened the requirement for compensation to cases that involve a partial permanent physical intrusion and a temporary complete physical taking.
- The *Lucas* decision requires compensation where a regulation "denies all economically beneficial uses of land" except where the regulation is consistent with the "background principles of nuisance and property law," but the meaning of those two phrases remains ambiguous.
- The Court in a prior case acknowledged that "the economic impact of a regulation on the claimant" is relevant to the determination of a compensatory taking, but the law still provides no clear guidance on the conditions under which a partial reduction in economic value must be compensated.
- And the above protections apply only to real property, not to personal property—even in the case of a total taking.

My guess, in the end, is that Lucas will receive his permit and, maybe, compensation for a temporary taking between 1988 and 1990. Lucas and a battalion of lawyers, however, may be the only beneficiaries of that decision. Scalia has drawn a line in the sand that may be washed away by the next political tide. Nino, we thought we knew you.

W.N.

Reforming the Government Role in Civilian Technology

Old superstitions die hard. Notwithstanding the collapse of communism and the emergence of a truly global market economy, belief in the virtues of government economic planning remains very much with us. In the United States the newest

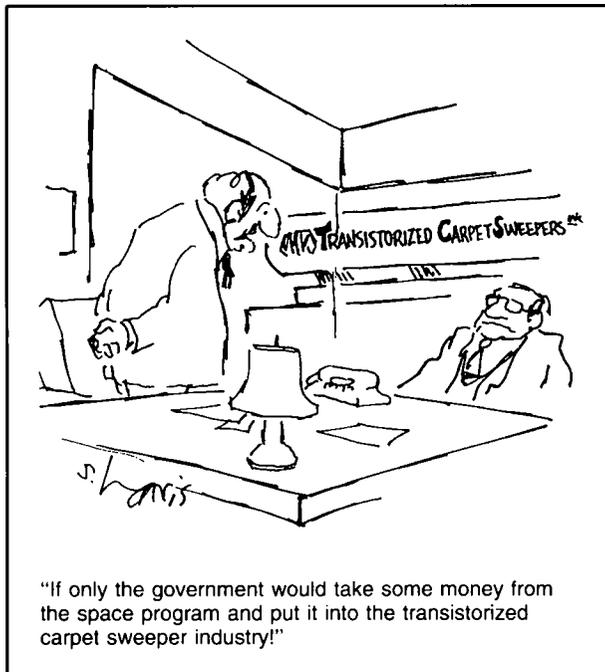
twist on that old theme is "technology policy"—essentially a souped-up, high-tech version of the more familiar industrial policy.

Now, however, instead of government-industry "partnerships" to salvage waning basic industries like autos, steel, and textiles, the call is for government involvement in promoting "critical technologies." Proponents claim that in many high-tech industries, American business is lagging behind the Japanese and European competition; the reason for this, they assert, is that other countries' governments actively support high-tech development, while ours maintains an anachronistic *laissez faire* approach.

Much of the cheerleading for technology policy comes from the usual suspects: Pat Choate, Robert Kuttner, Clyde Prestowitz, and so on. A recent report by the National Academies of Science and Engineering, though, has added both weight and sophistication to the arguments for an expanded government role. The panel producing the report was chaired by Harold Brown (secretary of defense under President Carter and former president of Caltech) and included such respected names as Fred Bergsten of the Institute for International Economics and Paul MacAvoy of Yale University. These are serious people, and their report (referred to here as the NAS report) deserves to be taken seriously. Furthermore, in the current presidential campaign Governor Clinton strongly endorses new programs very similar to those recommended in the NAS report.

To their credit, the authors of the NAS report have avoided many of the sins of their more polemical allies: there is no jingoistic rhetoric, nor any of the usual scare stories about America's coming economic ruin. Nevertheless, on the central question the authors face—identified in the report's title, *The Government Role in Civilian Technology*—they arrive at precisely the wrong conclusion. The overwhelming problem with government policy as it currently affects high-tech industries is *too much* government, not too little. The NAS report's proposal for increased government funding of commercial R&D is at best irrelevant and at worst would affirmatively harm American high-tech competitiveness. In any event, such proposals divert attention from the legitimate and important policy issues in that area.

According to the NAS report, the federal government in the postwar era has encouraged commercial development of new technologies chiefly by indirection: through the funding of basic research



and through the procurement of defense- and space-related systems that incorporate cutting-edge technology. That federal involvement has led to commercial "spinoffs" in microelectronics, computer systems, aircraft, biotechnology, and other industries.

Now, however, in the face of lagging productivity growth and mounting foreign competition, the authors of the NAS report urge the federal government to assume a more direct role in encouraging and facilitating technological innovation. Specifically, they propose government-industry collaboration in funding "precommercial" R&D and the creation of government "industrial extension services" to aid businesses in adopting already commercialized technologies. Their centerpiece recommendation is the creation of a \$5 billion federally funded "Civilian Technology Corporation," whose mission would be to "invest" in precommercial research projects.

The concept of precommercial technology, also known as "precompetitive" or "generic" technology, is the intellectual linchpin of high-tech industrial policy. The premise is that there is a gap between what universities do (basic research) and what corporate R&D departments do (commercial R&D); it is that gap that the federal government is now urged to fill.

There is something artificial about that concept, given the complex web of interaction between the academic and corporate worlds that is characteristic

of today's high-tech industries. There is no apparent precommercial gap in the clusters of high-tech companies that have grown up in Silicon Valley, Research Triangle, and along Route 128 in the shadow of major research institutions. Whatever its artificiality, though, the concept is extremely useful politically: it provides a basis for direct government involvement to promote explicitly commercial goals, while purportedly avoiding the problem of government's "picking winners and losers" that has plagued traditional industrial policy proposals.

The NAS report alleges that the precommercial gap constitutes a "market failure" justifying government intervention. The theory is that technology commercialization—the area between basic research and actually incorporating available technology into specific products—is often overly costly and speculative and insufficiently "appropriable" by any particular firm for private companies to risk their own money. Accordingly, the report maintains that "market mechanisms do not promote efficient levels of investment or performance in these areas."

Similarly, the report discerns another market failure in the adoption of newly available commercial technologies. The authors contend that there is an appropriability problem here as well; moreover, the problem has been worsened by the globalization of production and improvements in transportation and communications, all of which conspire to shrink the "window" within which adopting new technologies provides a competitive advantage for a given private firm.

Those market failure arguments simply do not add up. Clearly, private firms can and do commercialize new technologies all the time—look at the spectacular accomplishments of American businesses over the past twenty years in microelectronics, computer systems, telecommunications, pharmaceuticals, biotechnology, and elsewhere. Indeed, it is in those high-tech industries that we see capitalism at its most innovative and dynamic. There is no basis for saying that the market is not functioning; quite the opposite, technology is spreading faster, and product life cycles are becoming shorter than ever before in history. To argue that private industry is still somehow "underinvesting" in new technology implies that there is some kind of objective standard by which the present amount of investment can be judged. The NAS report, however, makes no attempt to define what the "efficient" rate of technological

development might be; it simply asserts, with no support whatsoever, that current performance is subpar. In other words, all the sophisticated-sounding talk about market failure is nothing but empty rhetoric.

In particular, the notion that economic globalization is undermining the adoption of new technology stands truth on its head. As the report itself admits, globalization has greatly accelerated the diffusion of new technologies and their incorporation into new products. How can that be grounds for concluding that the market is failing? It may be true that the benefits of adopting state-of-the-art technology are becoming increasingly fleeting; on the other hand, the downside of not keeping up with the latest technology has turned ever more drastic. The incentives, then, still point in the right direction; meanwhile, in an ever-shrinking world, the opportunities for acquiring new technologies have never been better.

Beyond those theoretical infirmities, there is the sorry historical record of past attempts by government to accelerate the advancement of commercial technology. Admittedly, the combination of basic research funding, defense spending, and the space program has given the federal government an important place in the genealogy of many high-tech industries. (That importance should not be overstated, however; the history of the electronics industry, for example, is replete with large, established companies getting federal research dollars and defense contracts, only to be routed by no-name upstarts.) That kind of government involvement, though, is not what technology policy is all about. Technology policy advocates are not content with spinoffs from government programs with other, noncommercial goals; they want government to step in and deliberately prod commercial development.

Unfortunately, past efforts along those lines do not augur well for future prospects. Consider the following white elephants: the SST, the breeder reactor, the Synthetic Fuels Corporation, the solar power program, and the space shuttle. The NAS report authors, it is true, distance themselves from those busts; they advocate smaller, more flexible programs, with cost-sharing by industry and greater attention to market signals. All very well, but that supposes that people like the members of the NAS panel can swoop into Washington and create and run programs in immaculate independence from political forces. This is a fantasy: if the idea of technology policy catches hold, one can

rest assured that the best-laid plans of academics, once thrown into the public-choice sausage grinder, will emerge unrecognizable to their authors.

Even in a best-case scenario, a fully implemented technology policy will resemble a large-scale Sematech. A look at Sematech's history is instructive, since the NAS report treats it kindly, and it fits the report's basic criteria for a successful program. Founded in 1987, Sematech is a consortium of the largest U.S. computer chip makers; its purpose is to engage in "precompetitive" R&D in semiconductor manufacturing. Consortium members together contribute over \$100 million a year to the project; the Pentagon kicks in another \$100 million every year.

Sematech was established amid fears that the U.S. chip industry was on the verge of collapse. During the first half of the 1980s, American companies had been steadily losing market share to their Japanese competitors, primarily because they were evacuating the market for high-volume, standardized memory chips. It was thought that the loss of the memory-chip market would start a domino effect; Sematech was founded to regain that "strategic" sector.

Five years later, U.S. companies still have only a small share of the "commodity" memory chip market, Sematech notwithstanding. The U.S. industry, though, has experienced a dramatic comeback, stopping the overall market share slide and even gaining ground. The turnaround had little if anything to do with Sematech; it was led by smaller companies that did not even belong to the consortium. The key to success has been to concentrate on what has always been the chief American strength in the memory chip industry: specialized, design-intensive chips that command high prices and earn large profits. Sematech supporters had derided those low-volume chips as peripheral, niche-market products.

The lesson of Sematech is this: even with an "industry-led" project, even with flexible, market-oriented management, the government flatly misdiagnosed the problem. As governments ever tend to do, it sided with large, highly visible losers in a vain effort to preserve the status quo. A Civilian Technology Corporation can be expected to do the same—bankrolling lost causes while oblivious to new and exciting trends.

Backing the lost cause of government planning, the NAS report ignores the truly important policy issues concerning technological development. It

sees market failures where there are none, but misses the manifest government failures that presently hinder American high-tech businesses. New technology is frequently developed by new companies; all too often, though, promising start-ups die at birth with their financial umbilical cords twisted by capital gains taxation and Glass-Steagall restrictions. Drug companies must bear the tremendous costs of the FDA review process; now there is congressional pressure to control the prices they charge as well. Electronics companies lose overseas markets because of outdated export controls. Regulatory gridlock stymies the development of biotechnology for agriculture. Telephone companies, with their enormous resources, are still prevented from competing in equipment manufacturing and cable television.

More generally, American industry labors under the heavy burdens imposed by OSHA, the so-called civil rights laws, and environmental regulation. Those costs weigh most heavily on the smaller, innovative companies that are the vanguard of technological change. Furthermore, anti-trust restrictions still discourage collaborative ventures in research and production that can spread the costs of high-tech innovation. And protectionism injures U.S. companies that need to source inputs, components, and equipment from overseas.

Those are the types of problems that anyone truly interested in reforming "the government role in civilian technology" would need to address. By all means let us have a technology policy, but let it be based on this sound principle: "First, do no harm."

Unfortunately, all the momentum is currently with a technology policy that advocates more government, not less. The Bush administration openly supports government assistance for pre-competitive technologies, and federal spending on commercial R&D is increasing steadily. Meanwhile, Governor Clinton has called for the creation of a new federal agency to support "critical technologies." For the time being, then, supporters of the free market have little going for them except the budget deficit. That may suffice to kill any big showcase project; with smaller and less visible programs, though, the future of high-tech welfare looks all too bright.

B.L.

Rationing Health Care While Writing Blank Checks for Environmental Health Hazards

Medical care is one of the most visible items on the national agenda. Politicians and op-ed commentators complain that while we spend about \$800 billion annually on medical care, about 36 million people are uninsured and many millions more receive substandard medical care—including 12 million children under the age of eighteen who do not receive preventive care. Economists point out that those high costs also diminish national productivity and our ability to compete in the world marketplace. While the economists are correct, the problem is much worse.

Those statistics on medical care expenditures are numbers reported by the Health Care Financing Administration. They exclude a significant portion of the nation's real medical care costs: the costs of reducing environmental, occupational, and product risks to health and safety. Those statistics also exclude other costs associated with preventive medical care such as exercise, nutrition, and family planning. Such costs ought to be included in the nation's medical care budget under preventive medical care.

If we include all the costs of preventive medical care instead of artificially separating the costs of complying with environmental, occupational, and product safety regulations, the United States will spend approximately \$975 billion on medical care in 1992. About \$140 billion are attributable to environmental, occupational, and product safety regulation.

Thus, the issue is not whether we are spending enough on preventive medical care, but whether we are spending those enormous sums wisely. No discussion of the U.S. medical care system or set of proposals to improve it is complete without a critical evaluation of the efficacy and efficiency of expenditures on environmental controls imposed to protect the public health and a determination of whether there are better ways to achieve that goal.

Those determinations require benefit-cost analysis, a tool rarely used by policymakers, who often argue that it is immoral or unethical to ascribe any value to human death or suffering. Their argument is, at best, disingenuous. First, such an argument can be valid only if there are no constraints on society's ability to solve all its outstanding

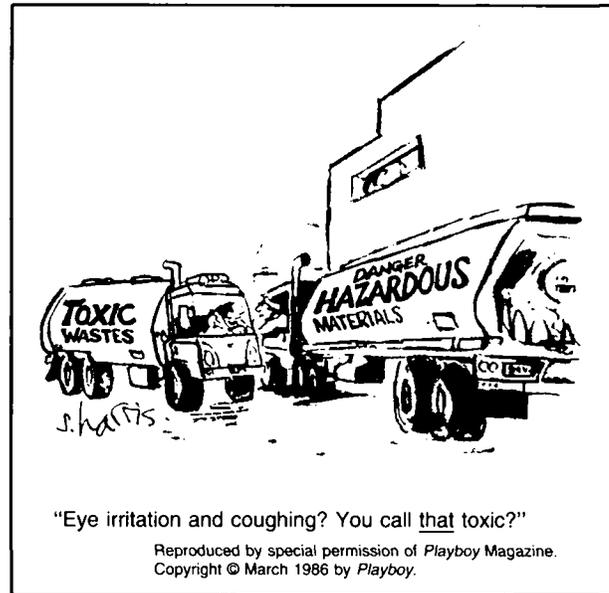
problems immediately. With limited resources, however, policymakers face tough choices among competing programs. As a result, our nation labors under a \$400 billion deficit while worthwhile societal goals such as broader medical care coverage are not met.

Second, while the Environmental Protection Agency proposes to address health risks that could increase lifetime cancer risks by one in a thousand to one in a million or lower, the traditional medical establishment struggles with risks from cancer and heart disease that are orders of magnitude greater. For example, one out of three Americans will contract cancer, and one out of four will die from heart disease.

Third, the EPA's risk estimates are based on a series of questionable assumptions that substantially overestimate risks. In fact, some of the environmental health risks that the EPA addresses may exist only because of the assumptions themselves, while there is no doubt about the reality of the health risks generally addressed by the traditional medical care establishment.

For example, in estimating the health risks posed by toxic air pollutants, the EPA assumes that an individual spends twenty-four hours a day, every day of the year, for seventy years outdoors at the spot where the pollutant is at its maximum concentration. But most people spend a good part of the day indoors. In addition, they travel to different locations during the day and move their homes several times in a lifetime. Moreover, the chances are about one in three that an individual will be dead before getting a "lifetime's" worth of exposure. There is even the likelihood that entire industries may evolve, if not relocate, during that lifetime. Hence, even discounting arguments about whether extrapolating from rats or other animals and from high to low doses is appropriate and about whether the models used are biased, the EPA's estimates of risk from toxic air pollutants are excessive. Such overestimates distort the nation's priorities and misallocate society's resources so that we address marginal, rather than deserving, problems. It is indeed ironic that while there is talk of rationing or reducing the services of traditional medical care providers to contain costs, the laws give the EPA and other regulatory agencies a blank check to address marginal health risks.

Clearly, the medical care debate should be expanded to include a critical evaluation of the efficacy and efficiency of \$175 billion spent annually on preventive medical care, including the



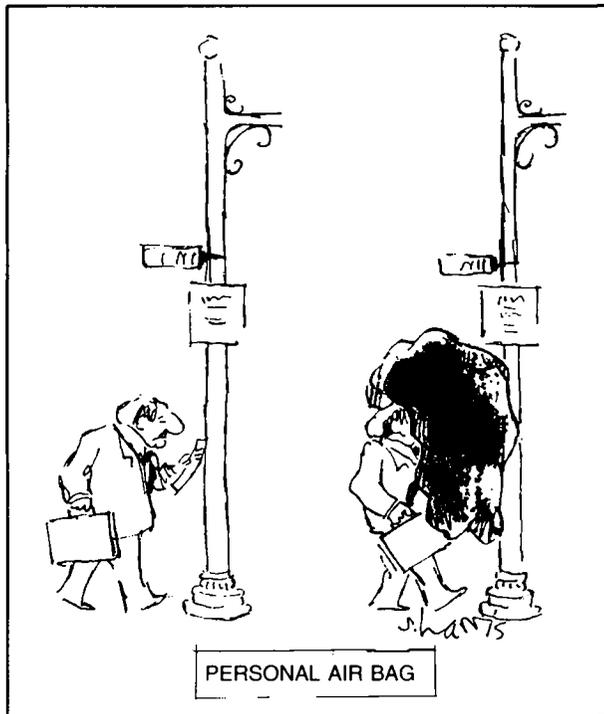
costs of complying with environmental, occupational, and product safety regulations. In particular, we need to focus on what the nation receives in return for those massive expenditures and whether those expenditures can be reallocated or better focused to improve the public health.

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Are Drivers' Behavioral Changes Negating the Efficacy of Mandated Safety Regulations?

Over the past twenty-five years, the federal government has taken an increasingly visible and proactive role in response to perceived market failures in automotive safety. Recent manifestations of that involvement include the requirement that all new automobiles have airbags by the mid-1990s and the extension of all automotive safety standards to light trucks by the year 2000.

A sizeable body of economic literature has developed over the efficacy of government safety regulations. Predominantly benefit-cost based, much of that literature has been a response to Sam Peltzman, who concluded that government-mandated safety regulation would have little net impact on the economic losses emanating from



motor vehicle accidents. Peltzman argued that the market already addressed the nonregulatory demand for safety and that mandated safety devices may encourage driver carelessness. With regard to the latter point, Peltzman presented evidence that while mandated safety devices may have prevented the deaths of some vehicle occupants and the associated insurance losses, those savings were accompanied by increased losses from nonoccupant deaths and a higher frequency of nonfatal accidents.

Most researchers, however, have concluded that the benefits from various proposed or mandated safety appliances exceeded their costs. Robert Crandall and John Graham best summarize the response to Peltzman by noting that "the intrinsic engineering effects of safety devices appear to swamp the behavioral response." Only one model found behavioral responses, and in that model they came only from an increase in pedestrian and cyclist deaths, not from higher vehicle occupant losses.

Of all the government-mandated safety appliances, the airbag has been perhaps the most controversial, with the debate spanning more than twenty years. In this note we evaluate initial evidence garnered from personal injury insurance claims to consider whether the data support Peltzman's hypothesis that mandating airbags increases driver carelessness or the conventional

wisdom that such a mandate has no behavioral effects. If the conventional wisdom is correct, we would expect insurer losses, as measured by injury claims filed by occupants of airbag-equipped cars, to decline relative to claims filed by occupants of autos without airbags. If Peltzman's hypothesis is correct, accidents resulting from driver carelessness would offset the decrease in claims attributable to the improved engineering.

The Data

Since the early 1970s, the privately funded Highway Loss Data Institute has published the injury claim frequencies incurred by insurers for specific cars and light trucks. Financial support for that institute is provided by the Insurance Institute for Highway Safety, which in turn is funded by auto insurers directly or through their trade associations.

The Highway Loss Data Institute's reports compare separately the frequencies of occupant personal injury claims and collision (physical damage) claims for specific vehicles by model year. The most recent report is based on almost 11 million observations (insured vehicle years). Injury claim frequencies include all personal injury and death claims filed for occupants of the insured vehicles in the twenty jurisdictions that have personal injury protection coverages—the so-called no-fault states. For any given crash, all claims against a particular policy are counted as a single claim. Using vehicle identification numbers, the institute adjusts the data for exposure and operator age group. The data are presented annually by car line as a relative claim frequency index, with 100 representing the mean claim frequency of all passenger cars combined. For instance, over the 1988 through 1990 model years, relative claim frequencies for cars ranged from a high of 184 for the Hyundai Excel two-door sedan to a low of 37 for the Chevrolet Caprice four-door sedan.

Since driver-side airbags first became standard on a large number of models in the 1990 model year, we could not use actual loss experience to determine the extent to which airbags may influence drivers' behavior until the release of insurer claims on those vehicles in late 1991. Between publication of the 1989 and 1991 Highway Loss Data Institute's *Insurance Injury Reports*, driver-side airbags became standard equipment on twenty-one model cars.

The Results

Barring any behavioral changes, occupants of cars equipped with safety appliances should have lower relative insurance claims than occupants of vehicles not so equipped. Note that none of the vehicles was downsized over the reporting period. If drivers become more careless when safety equipment is mandated, however, the change in relative insurance claims for cars so equipped would be small or negative.

When we compare the relative injury claim frequency for occupants of twenty-one vehicles during the last year that they were belt-equipped (1989 or 1990) with their relative claim frequency in 1991, when they were bag-equipped, the relative injury claim frequency increased in sixteen instances. The probability that random effects would increase the relative frequency in sixteen or more of the twenty-one airbag-equipped cars is only 2.6 percent. Interestingly, each of the five vehicles with lower relative injury claim experiences was driven by older drivers or by those with a perceived demand for safety. In addition, for eighteen of the cars, the relative collision (physical damage only) claim frequency increased relative to their performance when the autos were belt-equipped. There is a .07 percent chance that such a result could have occurred at random.

Interpreting the Results

On the basis of the strength of the results for both relative injury and relative collision claims, it is likely that some change in driver behavior or in the vehicle selection process has occurred. Three explanations come to mind. Unfortunately, the data, which insurers collected to aid in ratesetting, do not permit testing of each hypothesis.

The first explanation is that occupants of airbag-equipped cars, feeling safer, reduce their use of seatbelts. The General Accounting Office has

found that when airbags are not used in conjunction with seat belts, they are less than one-half as effective as seat belts themselves. But the Highway Loss Data Institute has found that seatbelt usage by occupants in airbag-equipped vehicles is comparable to usage in other vehicles.

A second explanation, one that is supportive of Peltzman's hypothesis, is that drivers of airbag-equipped cars, feeling safer but comfortable with their previous level of risk, may drive more aggressively and thus negate the legislative intent. That result reflects the old notion that a safer ladder encourages users to climb higher. Supporting the second hypothesis is the finding that the relative collision loss experience for airbag-equipped vehicles increased. The estimated \$1,000 replacement cost of an airbag system would also tend to increase the relative collision loss of models so equipped, however.

A third potential explanation for our finding is that we are observing a real consumer demand for safety. That is, people who perceive themselves to be at risk for whatever reason—type of driving, annual mileage, driving location, or personal characteristics—may seek out autos that they perceive to be safer. Since airbags are the most conspicuous safety appliance, demanders of safety may gravitate to such vehicles. The observed increased relative injury claim frequency for airbag-equipped vehicles may reflect a change in vehicle ownership and driver mix. This last hypothesis is also consistent with the worsening of the relative collision loss experience.

Further study is warranted to ascertain whether we are seeing the driver behavioral changes as hypothesized by Peltzman or whether the results reflect a real consumer demand for safety.

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and

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