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Crandall, Gruenspecht, Keeler, and Lave's *Regulating the Automobile*

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1. Introduction

■ Roger Smith, GM's chairman, called automobiles the "newest regulated industry." He was referring not to the capturable ministrations of a single agency, but rather to the cumulative effects of disparate Federal regulatory initiatives over the 1960s and 1970s. Although some Federal initiatives have helped the industry (the Chrysler financial bailout and restrictions on Japanese imports), it is easy to be sympathetic to the industry view. Regulation of auto emissions and safety has had dramatic effects on automobile design. Although they have rarely been binding, the Corporate Average Fuel Economy (CAFE) regulations threatened to lower automobile manufacturers' profitability during any period with cheap fuel. And another attempted fuel-saver, the Federal requirement of 55-mile-per-hour speed limits, has lowered the value of automobiles in use. Over the period in which these regulations were put into place, the domestic industry has seen its demand shifting rapidly back and forth between large and small cars and its overall market share declining as imports rose. The regulations, by contributing to the uncertainty and uncontrollability of the period, seemed to Detroit ill-timed at best and costly and without benefits at worst.

In *Regulating the Automobile,* Crandall, Gruenspecht, Keeler, and Lave attempt a definitive treatment of a subset of these new Federal regulations. They focus on what might be called the "auto-design" regulations; emissions control, CAFE, and safety standards.[1] An implicit conclusion of the book is that the regulatory problem is important—at the peak, compliance costs for all three types amounted to more than 10% of the price of a new car. (See Figure 2-2, p. 17.) The explicit conclusions that current or planned standards in all three areas are not cost-beneficial and that the regulations have been poorly thought out and inefficiently implemented are an indictment of the regulatory record.

The approach throughout is classical: the role of government regulation is to pursue the public interest, while the role of scholars of regulation is to assess whether that goal is achieved, not why it is being missed. The conclusions, the approach, and the topics considered might suggest that this is an autumnal book; a great deal has previously been written on these topics. Some controversy remains, however, and the book opens some interesting new ground. This review will first take up the substantive areas of emissions, fuel economy, and safety and then turn to the book's general points about the process of regulation.

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[1] Although the 55-mile-per-hour speed limit shares the safety and fuel-economy goals, the authors omit it.

2. Emissions controls

■ Over the last twenty years Federal standards for automotive emissions of carbon monoxide (CO), of unburnt hydrocarbons, and of nitrogen oxides (NO_x) have been dramatically tightened. Several of the standards were "technology forcing," in that then-existing automobile engineering knowledge was insufficient to meet them. This led to anguished cries from Detroit that the standards could not be met. Although the timetable for lowered emissions was allowed to slip, it is clear that the major standards of the early 1970s were put in place more rapidly than they should have been. With the exception of recent state inspection programs, emissions controls have applied entirely to new cars. As the automobile fleet slowly turns over (scrappage rates declined in the early 1980s), these new-car standards translate into lower emissions per mile travelled. By 1983 hydrocarbons and CO emissions per vehicle-mile travelled had declined below 40% of their uncontrolled levels, with NO_x emissions' falling more slowly. (See p. 92.) Vehicle lifetime compliance costs (including maintenance, foregone fuel economy, and the extra costs of unleaded fuel) rose to $1,400 per car ($1981) with the (now current) 1981 standards (White, 1982).

Regulating the Automobile opens its analysis by providing new evidence on the cost side. Most earlier work on costs was based on accounting-engineering methodologies. In a novel analysis (see Appendix A) data on the costs of owning and operating an automobile are regressed on (among other things) the accounting-engineering cost figures. The results confirm that the traditional methods had the cost levels for emissions control and safety compliance roughly correct. On the basis of this (and of analysis of the benefits of emissions controls in chapter 5), the authors conclude that automobile emissions standards have marginal costs far in excess of their marginal benefits.

I have serious doubts on this score. My recent work with Yao (1985) measured the nonpecuniary costs of automobile emissions controls—losses in drivability, cold-start performance, etc. We found dramatic nonpecuniary costs of compliance with the earliest standards. But later advances in compliance technology ("smart" catalytic converters) have permitted tremendous improvements in automotive performance. As a result, the effects of adding that new technology include both regulatory compliance costs and the benefits of increased quality. As in earlier work, *Regulating the Automobile* looks only at the pecuniary costs of the regulations. Subtracting out the value of recent increases in product quality incorrectly accounted as regulatory compliance costs, Yao and I find that the quality-adjusted costs of recent regulatory standards were essentially zero. The relation of cost to benefit for current levels of emissions control is at least controversial.

A second conclusion of *Regulating the Automobile,* that the process by which Federal emissions standards are set and enforced is seriously flawed, is impossible to doubt. The authors make two main arguments. The first is that Congress (which keeps the standard-setting function itself) has been systematically cavalier about emissions-control costs and, especially, benefits. Even now, surprisingly little is known about the relationship between the flow of pollutants emitted and the stock of ambient air quality, or about the health (and other) effects of changes in air quality.[2]

The second argument turns on the fact that only new cars are affected by most existing regulations. In a very long transition period the automotive fleet will have a mixture of very clean and very dirty (older) cars. Cost-effective regulation should contain incentives to retire or to repair extremely dirty older vehicles. These clear regulatory failures in the emissions-control case become a theme of the book; I shall return to them shortly.

[2] This hypothetical is very useful in friendly discussions about the precision of economic science: Which of two groups will do a better job in quantifying the effects of a standard that increases per car costs by $1,000 and decreases emissions by 90%? The economists are to estimate the effect on auto production, GNP, etc., while the best available "hard" scientists are to work out the health effects. Outside the laboratory, we eat them alive.

3. Fuel-economy regulation

■ No economist finds it easy to say anything good about the CAFE, and the authors are no exception. Private markets provide adequate incentives for fuel economy when fuel is expensive or likely to become so, and provide (as they should) incentives for large, comfortable cars when fuel is likely to be inexpensive. (See chapter 6 for estimates of the force of market incentives for fuel economy.) The CAFE did have a singular advantage: it had little effect on its first decade, but created the impression that regulators were "doing something." It has been binding for a few years now and is becoming expensive: *Regulating the Automobile* is right to suggest scrapping it.

4. Safety regulation

■ From 1966, the time of the National Traffic and Motor Vehicle Safety Act, to 1974 a series of Federal auto safety standards were enacted. These can be divided roughly into three classes according to their purposes: lowering the probability of accident (e.g., dual braking systems), decreasing the severity of injuries resulting from accidents (e.g., lap-shoulder seat belts), and lowering vehicle repair costs (e.g., bumper standards). Costs of the latter two classes are roughly the same, while the accident avoidance standards are somewhat less expensive. (See equipment cost estimates on p. 34 and the discussion of fuel economy costs on p. 37.)

For the last decade the regulatory debate has centered on one issue: "passive" restraints, such as air bags. Passive restraints, which are likely to be made mandatory in a few years, would resolve a current problem: lap-shoulder seat belts are an extremely effective occupant-protection technology, but very few people wear them. On the other hand, the most likely passive restraint technologies are very expensive, probably several hundred dollars per car.[3]

Regulating the Automobile first attempts a cost-benefit analysis of the existing regulations. This analysis measures the benefits of the safety regulations primarily by their effects on avoided fatalities. The use of this objective, which is clearly not the only one possible, is undoubtedly a response to the attention focused on Peltzman's (1975, p. 717) conclusion: "The one result of this study that can be put forward most confidently is that auto safety regulation has not affected the highway death rate." Theoretically, Peltzman concluded that rational drivers in cars that are made safer by regulation will drive less safely. Empirically, he found that this response is so large that it completely offsets the original increase in car safety.

An important conclusion of the book is that (although offsetting driver behavior does exist) the "Peltzman effect" is much smaller than Peltzman concluded.[4] The methodologies used are those employed by Peltzman: aggregate reduced-form regressions with accident fatalities (of various types) as the dependent variable, run on national time series and in the cross section of states. Crandall *et al.* conclude that the net effect of safety regulations has been to increase safety, roughly by the amount engineering studies would suggest. Safety regulation has been efficacious: the authors go on, with calculations of the value of the lives saved, to conclude that it has been cost-beneficial as well.

This conclusion creates something of a problem for economic analysis. Occupant-safety regulations' benefits go primarily to the purchaser of the car (and his/her family). The costs are overwhelmingly borne by the seller. How can forcing people to buy and sell more safety than they wanted to have have been cost-beneficial?[5] Their line of analysis is

[3] Passive belt systems, air bags, the ignition "interlock" system used on 1974 cars, and enforcement of laws compelling seat belt usage all differ in their costs, effectiveness, and the extent to which they annoy consumers. Air bags are the likely regulatory technology, since they are the most difficult for drivers to evade. (See pp. 81–84.)

[4] This finding reinforces earlier work, such as that of Graham (1983).

[5] The benefits and costs in the authors' calculations are all private and involve no externalities.

contradicted when the authors turn to passive restraints. They argue (pp. 81–84) that air bags can only be supported on paternalistic arguments; otherwise one should trust drivers' valuation of their own safety. I am uncertain that we know enough about drivers' and passengers' safety behavior to speak confidently on these issues. How can three-point seat belts be cost-beneficial when more than four-fifths of them go unworn? Can forcing automobile occupants to wear them by law or requiring the installation of passive restraints improve welfare? Recent work by Mannering and Winston (1986) begins to analyze these questions, but to date not enough is known.

5. Implementation of regulations

■ Two major implementation themes run through *Regulating the Automobile.* The first is that the goals of regulatory policy often conflict with one another. For example, with auto-design technology constant, a safer car, or one with lower emissions, will be less fuel efficient. As a substantive point, this is clearly empty rhetoric—a fancy way to say that some of the costs of safety or emissions control are operating costs. But as a point about the way in which the federal regulatory process has gone forward, it is very well taken. Each of several "regulators"[6] sets goals, standards, and timetables without a clear idea of their overall impact. When the marginal cost of regulation is rising, and (as here) increased regulation along each dimension raises the marginal cost of others, then the combined effect of disparate regulations can easily be excessive. This strikes me as insightful and probably correct.

The authors also have a proposal to improve the regulatory process: a superagency with responsibility for all regulation of the automobile industry, with a mandate to do enough research to be sure what the cost-beneficial regulations are with all of the interaction effects considered. What researcher can oppose that? Some of the money is sure to be spent on us, especially if both the agency and the automakers think our work is sound.

The second major implementation point concerns the focus of almost all regulations on new cars. Since such regulations raise the relative price of new cars, they induce substitution toward older ones. In the short run this can actually frustrate the goal of the regulation by lowering the scrappage rate for dirty, unsafe cars. Gruenspecht's (1982) work (which is extended in the book), for example, shows that emissions controls have actually raised pollution in some years. Since an uncontrolled car is vastly dirtier than a car complying with current standards, it takes only a small substitution effect to get this result. This is a solid point, and I suspect that it is of even greater importance in other areas where new sources of an externality are regulated more stringently than existing ones. When the different sources are different firms, new-source bias will reduce competition as well as induce inefficiencies.

6. Conclusions

■ If we believe the results in *Regulating the Automobile,* the regulation that could not be cost-beneficial was—safety—, the one that could be was not —emissions—, and the entire history is a comedy of regulatory implementation errors. It is hard to generalize from the automobile regulatory experience. Consumerism, environmentalism, and fuel-price hysteria all hit the auto industry in a vulnerable period. These mass-market regulatory initiatives are rare, and they even more rarely overlap so intensely in a market that is changing unpredictably. All this faced Congressmen and administrators with tricky problems, and I would tend to be somewhat gentler on the regulators than the authors were. On the other

[6] Each of which is a complex creature, comprising a Congressional committee, a regulatory agency, numerous experts of all forms, and at least one GM vice president. Consistent with its public interest view of regulation, the book treats each of these "regulators" as at least intending to increase welfare.

hand, the book's focus on the real-world implementation issues is a model for further work. It turns on a deep understanding of the particular industrial context of the regulations and a fine sense of the unobvious indirect effects of government action.

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