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Auto Insurers and the Air Bag

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ABSTRACT

The intense lobbying effort by auto insurers in support of air bags as opposed to mandatory seat belts has been characterized as a struggle to save human life. But seat belts and air bags both reduce injuries and fatalities. Unlike seat belts, however, air bags transform the nature of losses from an auto accident, resulting in property claims rather than bodily injury claims. Passive air bags also are more effective in guarding against injuries associated with costly and unpredictable court awards. These features make air bags attractive for transforming difficult-to-predict uncertainty into risk, which can be forecasted with accuracy. The result: Insurance is a more effective risk management instrument.

Introduction

With passive restraints and air bags standard equipment on a growing number of new automobiles, it may be difficult to recall the intense political battle that led to the advent of these safety devices. The struggle to mandate air bags on all new cars sold in the United States began over 20 years ago and came to a climax in the mid-1980s, when states passed mandatory seat belt laws as part of an attempt to overturn a national air bag rule. Since then, a combination of regulatory and market forces have delivered an increasingly bag-equipped fleet.

During this struggle, automakers, insurers, health professionals, consumers, and others lobbied either for or against air bags. Of particular interest were the opposing positions taken by automakers, who preferred mandatory seat belt laws, and auto insurers, who preferred a passive restraint mandate. The rationale behind the auto industry's position seems straightforward: Mandatory belts were the low-cost alternative from their standpoint.¹ However, since

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¹ Another problem faced automakers: Who would be liable in the event that an air bag failed to deploy? Mackay (1991, p. 215) claims that this was an important reason that auto producers opposed air bags.

mandatory seat belts and air bags are both pro-safety, the auto insurers' story is more complex.

This article focuses on the special interest motivation of the insurance industry in its support of air bags. We argue that auto insurers were not lobbying solely for greater safety (and reduced claims) as the effort is sometimes characterized. We believe the industry wanted to change the nature of the automobile hazard, effectively to alter the nature of losses and to convert uncertainty of future claims into risk. That is, insurers used the political arena as a mechanism for improving actuarial predictability and thereby enhancing insurance as a risk management alternative.

Our article first reviews the passive restraint struggle as it unfolded and matured during the years 1968 to 1984, with particular emphasis directed to the role of insurance. Next, we examine the flaws in the claims reduction explanation for insurers' lobbying efforts in support of air bags. We then highlight three important attributes of air bags: (1) The passive and predictable nature of the devices, (2) their relative effectiveness for limiting certain types of injuries, and (3) their ability to convert bodily injury claims to property claims. These attributes form the basis for an uncertainty reduction explanation of auto insurers' support for air bags. Uncertainty reduction by regulation is then presented briefly in the context of the transactions-based modern theory of the firm.

The Passive Restraint Struggle

Auto insurers were the leading protagonists throughout the history of the air bag struggle. Companies such as Allstate were involved quite early, and later industry support was provided to fund the efforts of Ralph Nader's Center for Auto Safety, which became a major player in the regulatory saga (Capital Research Center, 1987).

In 1968, soon after the development of the first working air bag, Allstate joined forces with Ford Motor Company and Eaton Corporation in "helping with the testing and mounting of a pro-bag campaign" (Holt, 1979, p. 147). In 1970, the National Highway Safety Board announced a passive restraint mandate. From then on, auto insurers encouraged air bags. In October 1973, Allstate announced a 30 percent discount on medical and no-fault personal injury insurance for air bag equipped cars, which effectively cut the price of the bundled products (Holt, 1979, p. 147). The incentives, however, did not induce consumers to buy passive restraints (Robertson, 1984).

After a number of regulatory and legal setbacks that delayed the initial requirement for passive restraints, a new rule was announced in June 1977. The insurance industry intensified its lobbying efforts. American Mutual Insurance Alliance spokesman Donald Seagraves, representing writers of 95 percent of the nation's auto insurance policies, indicated monolithic support for the new passive restraint rule (Insurance Institute for Highway Safety, 1977).

But in 1981, following another series of regulatory delays, officials of the new Reagan administration rescinded the passive restraint proposal. Again,

insurers responded in support of the rule. State Farm Insurance Company and the National Association of Independent Insurers (NAII) petitioned for judicial review of the National Highway Traffic Safety Administration (NHTSA) ruling. Almost two years later, by a 5 to 4 vote, the Supreme Court upheld a court of appeals ruling in favor of State Farm and remanded the decision to the Department of Transportation (National Highway Traffic Safety Administration, 1983, p. 3).

In 1984, the passive restraint struggle came to a climax when then Secretary of Transportation Elizabeth Dole announced that all newly produced cars sold in the United States would be equipped with passive restraints by September 1989, unless two-thirds of the country's population was covered by state mandatory seat belt laws (*Federal Register*, 1984). This effectively gave special interest groups the choice of lobbying states in favor of mandatory belt laws and against air bags, or vice-versa. Auto insurers again responded. State Farm and the NAII filed suits claiming that "Dole's order is illegal in allowing state legislatures the power to rule out passive restraint installations by approving seat-belt laws" (Middle Lane, 1984). Since that time, the air bag has become a common feature of automobiles, and passive restraints are standard items on new autos sold in the United States.

The Puzzle: Why Did Insurers Favor Air Bags?

At first glance, the position of auto insurers in favor of air bags seems straightforward: Air bags save lives and reduce insurance claims.² By lobbying for air bags, insurers can reduce their costs while improving their public image. Cost containment is also important in states where regulators tend to pass legislation mandating rate reductions.

But as a long-term lobbying strategy, a pure claims reduction argument must consider ultimate effects. Auto insurers provide a distinctly different product than, say, auto producers. No doubt, auto producers would support regulations that coordinate reductions in production costs (for example, the selective reduction of trade barriers to allow the entry of steel used primarily in auto production). But the value of expected claims in automobile insurance is a variable in both the demand for and the supply of automobile insurance. Simply put, individuals will demand less insurance protection when the expected value of losses is reduced. At the limit, if automobile-related fatalities and injuries were eliminated, automobile insurance would be reduced to indemnification for physical damage losses.

However, insurers operate well within the limits where bodily injury claims fall to zero. Therefore, insurers logically seek to reduce the probability of

² Although the numbers are subject to intensive debate, the NHTSA estimates that a passive restraint mandate would prevent approximately 9,000 fatalities and 65,000 injuries annually. On that basis, which assumes no compensating behavior responses from drivers (Peltzman, 1975; Cantu, 1980), Nationwide Mutual estimated insurance savings of \$2.4 billion annually (U.S. Congress, 1981).

catastrophic losses, thereby increasing the value of the insurance contract. Catastrophic losses are more frequently associated with bodily injury than with property damage. In addition, the variation in bodily injury claims and associated general damages is larger than that in property claims. That is, an insurer faces a higher risk when writing coverage for bodily injuries than for property damage.

Data for the 1980s on the average loss per insured car, including those not involved in accidents, illustrate the point.³ The average loss for bodily injury claims increased almost two and a half times during the decade. Average losses for property damage rose 178 percent, while the consumer price index increased one and a half times. More to the point of risk management, the coefficient of variation for average losses from bodily injuries was 0.304, as compared to 0.197 for property damage losses. Claims for bodily injury were more volatile and increased more rapidly through the decade.

The possibility of shifting the nature of insured losses from bodily injury to property losses, and thereby reducing the risk faced by insurers, was discussed by the industry in the passive restraint proceedings (*Federal Register*, 1984, p. 28967). As an integral part of the automobile itself, air bag technology, which must be repackaged after deployment, would increase property losses in less severe accidents and increase the occurrence of total property losses in other instances. Increased occurrence of property losses would be a tradeoff for reductions in certain kinds of bodily injury and general damage claims.⁴

Claims that auto insurers were solely motivated by efforts to reduce fatalities brings up another puzzle. Health and life insurers largely stood on the sidelines while auto insurers led and funded the air bag effort. This, despite the fact that health and life insurance costs were expected to fall by as much as \$1.1 billion under an air bag rule, about half of the cost savings expected for automobile insurers (*Federal Register*, 1984, p. 28987).⁵ We believe an explanation for this inaction is found in the fact that life insurers can predict the risk of auto-related fatalities, with and without passive restraints, and that health insurers, which do not confront general damage claims from auto accidents, are more often than not collecting premiums based on past losses, as opposed to insuring risks. By contrast, auto insurers face the combined uncertainty generated by property damage and bodily injuries.

³ The data discussed here are taken and developed from Insurance Research Council (1990, p. 3).

⁴ We note that Cummins and Weiss (1992) found similar substitution effects in their investigation of no-fault insurance. Specifically, they found no-fault to be associated with total property claims frequency, that given the constraint on the right to sue for bodily injury liability, drivers increased suits for first-party property losses.

⁵ The three main companies that pushed for passive restraints were State Farm, Allstate, and Aetna. These three companies were ranked 1, 2, and 3, respectively, with respect to property-liability premiums written in 1983, but only 15, 24, and 4 with respect to life insurance premiums written (see Allstate Insurance Company, 1985). By contrast, Prudential, Metropolitan Life, and Equitable Life, the three leading life insurers that year, did not appear at all in the debate. And, while health care providers were involved in the political debate over air bags, health insurers appeared to have little interest.

Finally, if the claims reduction theory is valid, why did insurers provide at best lukewarm support for state mandatory seat belt laws, which, by many estimates, would lead to as many or more reduced fatalities and injuries vis-à-vis a national air bag rule (*Federal Register*, 1984; Lund et al., 1987; Wilson, 1979)?

Air bags provided something more to insurers than just life savings and claims reduction. The additional benefit of air bags rests on the unique safety attributes of the device, when compared to or even used with its next best alternative, the seat belt.

Air Bags and the Reduction of Actuarial Uncertainty

The Air Bag Attraction

Air bags have three attributes that we believe explain the economic attraction of the devices to auto insurers. First, air bags are passive. Regardless of a driver's attitude toward risk, he or she has no choice in the matter of safety protection provided by passive restraints. An element of risk that otherwise must be estimated by underwriters can be gauged largely from the engineering performance of the air bag. While air bags cannot be expected to perform perfectly, and are most effective in head-on collisions, their performance relative to seat belts is almost deterministic, not stochastic. There is no enforcement problem. A national standard for air bags, as well as for other passive devices (e.g., reinforced bumpers, protective windshields, and automatic braking systems) moves the entire driving population in a direction of homogeneous exposure units, which we term a move toward passive homogeneity.

A second attribute of air bags relates to the deterministic nature of their performance and involves the bag's relative protection for the most severe category of injuries and related court-awarded damages that result from air bags versus seat belts. Solid empirical evidence on the distribution of injuries was not available at the time of the seat belt controversy due to the absence of extensive and comparable experience with the alternative devices. However, engineering studies and the logic of how air bags operate led various specialists to conclude that, while seat belts, when utilized, were superior in reducing fatalities, air bags were superior in guarding against injuries to the upper torso, head, and face of accident victims.⁶ As pointed out in a statement by Insurance Institute for Highway Safety President Brian O'Neill,

⁶ An example of the kind of data on comparative effectiveness is found in Wilson and Savage (1973). The report relied on engineering and expert jury studies and examined data on 706 fatalities for 1967 through 1972 passenger cars, using reports from General Motors' Motor Insurance Corporation, the Department of Transportation, the University of Michigan, Cornell University, and other sources. The findings for frontal collisions show air bags alone to be 40 percent effective for protecting the head and upper torso. Lap and shoulder belts, when used, were 37 percent effective. Lap belts alone were 14 percent effective (Wilson and Savage, 1973, p. 13). Of course, the ultimate issue here is whether the driver will use the nonpassive systems. At the time of the controversy, 12.5 percent of U.S. drivers buckled their seat belts. That proportion multiplied by 37 percent yields a small predicted level of effectiveness. Comparisons of fatality reductions are also found in *Federal Register* (1984, pp. 28866-28869) and in Evans (1991).

The various laboratory tests indicate that lap/shoulder belts and air bags can provide significant protection in frontal crashes but that air bags can offer superior protection as crash severity increases. There are a number of possible reasons for this: air bags distribute the impact forces over a wider area of the torso than is possible with any belt system; unlike belts, air bags restrain the head; and the distance over which the energy of the torso is absorbed is greater with bags than with belts (O'Neill, 1983, p. 8).

Later analysis of crash data, which indicated air bag superiority for head and chest injuries, supported O'Neill's statement (Zador and Ciccone, 1991). The evidence supports a key point: Direct protection of the head and face reduces the extent of injuries and disfigurements that are often settled in costly and unpredictable court battles.

Research by the Rand Corporation on civil jury verdicts in Cook County (Illinois) across the 1960s and 1970s reveals the importance of uncertainty reduction (Peterson, 1984). The study found the real median value of awards in automobile-related injury cases to be constant across the two decades for moderate and very serious injuries, where income loss was low. However, the median value for such awards for serious injuries with disabilities and high income loss rose 22 percent in real terms across the decades (Peterson, 1984, p. 53). While we cannot distinguish the effects of economic versus general damages from this data, the Rand study did report the mean and median values for special damages awards for 16 injury categories across all plaintiff groups (automobile, industrial, etc.), which gives an indication of how a few extremely high awards can skew the distributions. In the serious injury category, the ratio of the mean to the median for paralysis and nerve damage is the highest at 4.3. The ratio is 3.0 for permanent facial injury and 3.5 for serious eye and ear injury, which are the kinds of auto-related injuries that laboratory tests and experience indicate are best reduced by air bags. As the Rand report put it, "the largest awards...became less predictable" in the decade of the 1970s (Peterson, 1984, p. ix).

We described the third attractive air bag attribute in our above discussion of relatively high volatility of bodily injury losses, as compared to property damage losses. The air bag could have the effect of transforming bodily injury claims into property claims. Cummins and Tennyson (1992) make a related point when they indicate that underwriting losses for bodily injury liability claims were "the primary source of loss inflation in tort states [of which there are 25], growing at a rate of more than 11 percent per year" across the years 1984-1989 (Cummins and Tennyson, 1992, p. 105). Bodily injury claims also contributed the largest component to premium increases in no-fault states (Cummins and Tennyson, 1992, p. 106).

Uncertainty Reduction and Firm Governance

The logic we have provided for insurers' support of the air bag is illuminated by the modern theory of firm governance, which focuses on transaction costs (see Williamson, 1985, and Coase, 1937). That theory examines

specialized activities that are produced at least cost *within* the firm. Other standardized inputs used to form a final product may be obtained economically from *outside* the firm.

We see air bags as a standardized substitute for part of the specialized risk assessment of driver behavior that is internally accomplished by underwriters. By substituting externally mandated passive restraints, which are homogeneous across all automobiles, for error prone internal predictions of driver behavior, the insurer transforms uncertainty, which cannot be estimated *ex ante*, to risk.⁷ Regulation delivered a more attractive package. The air bag shifts losses from bodily injury to property damage and moves the auto insurance hazard in the direction of an *a priori* probability distribution, improving predictability, enhancing the function of insurance, and allowing insurers to gain market share *vis-à-vis* other risk management alternatives.

Broader Applications of the Theory

Our theory of uncertainty transformation is consistent with insurer efforts to reduce moral hazard and adverse selection, which are long-recognized impediments to the insurance function (for example, see Greene and Trieschmann, 1981, chap. 2). The inability of insurers to provide certain types of insurance (pollution, day-care, municipal), their push for tort reform, and their support of no-fault insurance are all consistent with this notion of uncertainty reduction.⁸

Our analysis of the air bag episode adds the insight that uncertainty-based theory might explain a whole array of insurance activities, even beyond those that are clearly geared toward predictability. There are, after all, many *internal* ways that insurers can reduce uncertainty, including more detailed applicant screening and specifying a more carefully written contract. Then, there are *external* ways to affect uncertainty, which include contracting with manufacturers of risky products and lobbying for regulations that alter the nature of the insured hazard. The array of internal and external choices provides opportuni-

⁷ The theory is compatible with the findings of either Peltzman (1975) and Cantu (1980)—that improved auto safety generates predictably riskier driver behavior that increases fatalities—or the contrary findings and criticisms of Peltzman's work by Crandall et al. (1986) and Robertson (1984). Predictability, based on experience, is possible in either case.

⁸ As an example, denial of insurance coverage was most common in the mid-1980s, a period often labeled the time of the "insurance crisis" (see U.S. Congress, 1986; Priest, 1987; Abraham, 1986, 1988; and Vetri, 1987). A number of authors, including Abraham (1986, 1988) and Vetri (1987), maintain that uncertainty was the major reason for the crisis. Abraham (1988) explains the uncertainty problem this way: "Insurance can perform...effectively only under very special conditions of uncertainty. At one extreme—complete ignorance about the scope of the risk to be insured—insurance would resemble a naked gamble; at the other extreme—a world in which the future were completely predictable [certain]—there would be no point in insuring. Liability insurance may operate effectively between these two extremes, but it can be undermined in several ways; by adverse selection, moral hazard, or generalized uncertainty" (p. 946). Abraham goes on to speak to generalized uncertainty and efforts by insurers to convert that to risk, which can be diversified through pooling by insurers who then perform an economic function for the insured and can be successful in marketing their service.

ties for cost-reducing tradeoffs. As we emphasize, the tradeoffs between specialized internal action and standardized external activity can transform uncertainty to risk.

Conclusion

This article has considered alternative explanations for auto insurers' long-time political push for air bags. We offer a competing theory based on the idea that insurers saw the air bag as a unique safety device that could transform and reduce the uncertainty of future auto insurance claims. We maintain that uncertainty-based theories such as the one we have described can explain a whole array of insurance phenomena. The direct derivative of our research extends uncertainty reduction to insurance lobbying activities in other areas, such as for automatic brake systems, tort reform, and no-fault insurance.⁹ In all this, the firm seeking regulation is in effect "contracting out" as transactions are moved externally in an endless effort to minimize costs.

References

- Abraham, Kenneth S., 1986, Making Sense of the Liability Insurance Crisis, *Ohio State Law Journal*, 48: 399-411.
- Abraham, Kenneth S., 1988, Environmental Liability and the Limits of Insurance, *Columbia Law Review*, 88: 942-988.
- Allstate Insurance Company, 1985, Insurance Handbook for Reporters, Second Edition (Northbrook, Ill.: Allstate).
- Cantu, Oscar R., 1980, An Updated Regression Analysis on the Effects of the Regulation of Auto Safety, Yale School of Management Working Paper No. 15, New Haven, Connecticut.
- Capital Research Center, 1987, *Organization Trends* (Washington, D.C.: Capital Research Center).
- Coase, Ronald H., 1937, The Nature of the Firm, *Economica*, 4: 386-405.
- Crandall, Robert W. et al., 1986, *Regulating the Automobile* (Washington, D.C.: Brookings Institution).
- Cummins, J. David and Sharon Tennyson, 1992, Controlling Automobile Insurance Costs, *Journal of Economic Perspectives*, 6: 95-115.
- Cummins, J. David and Mary A. Weiss, 1992, Incentive Effects of No-Fault Automobile Insurance: Evidence from Insurance Claim Data, in: Georges Dionne, ed., *Contributions to Insurance Economics* (Boston: Kluwer Academic Publishers).
- Evans, Leonard, 1991, *Traffic Safety and the Driver* (New York: Van Nostrand Reinhold).

⁹ In the case of no-fault insurance, researchers have found that payments per insured motorist are actually higher in no-fault states, while the number of court cases is higher in traditional tort states (U.S. Department of Transportation, 1985). Hence, evidence that property-liability insurers support no-fault insurance is consistent with the uncertainty reduction hypothesis.

- Federal Register*, 1984, 49(138), July 17, Office of the Federal Register, Washington, D.C.
- Greene, Mark R. and James S. Trieschmann, 1981, *Risk and Insurance* (Cincinnati: South-Western).
- Holt, Donald D., 1979, Why Eaton Got out of the Air-Bag Business, *Fortune*, March 12, p. 147.
- Insurance Institute for Highway Safety, 1977, *Background Manual on the Passive Restraint Issue* (Washington, D.C.: IIHS).
- Insurance Research Council, 1990, *Trends in Auto Bodily Injury Claims* (Oak Brook, Ill.: Insurance Research Council).
- Lund, Adrian K., et al., 1987, Motor Vehicle Occupant Fatalities in Four States with Seat Belt Use Laws, SAE Technical Paper Series (Washington, D.C.: Insurance Institute for Highway Safety).
- Mackay, Murray, 1991, Liability, Safety, and Innovation in the Automobile Industry, in: Peter Huber and Robert E. Litan, eds., *The Liability Maze: The Impact of Liability Law on Safety and Innovation* (Washington, D.C.: Brookings Institution), 191-223.
- Middle Lane, 1984, *Time*, July 23, p. 47.
- O'Neill, Brian, 1983, A Note on Air Bag Effectiveness, Insurance Institute for Highway Safety Submission Docket 74-14, No. 32, Occupant Protection.
- Peltzman, Sam, 1975, The Effects of Automobile Safety Regulation, *Journal of Political Economy*, 83: 677-725.
- Peterson, Mark A., 1984, *Compensation of Injuries* (Santa Monica, Cal.: Rand).
- Priest, George L., 1987, The Current Insurance Crisis and Modern Tort Law, *Yale Law Journal*, 96: 1521-1590.
- Robertson, Leon S., 1984, Insurance Incentives and Seat Belt Use, *American Journal of Public Health*, 74: 1157-1158.
- U.S. Congress, 1981, House of Representatives, 97th Congress, Hearings Before the Subcommittee on Surface Transportation, January 28, Washington, D.C.
- U.S. Congress, 1986, House of Representatives, 99th Congress, The Liability Insurance Crisis Hearings Before the Subcommittee on Investigations and Oversight, January 21, 22, Washington, D.C.
- U.S. Department of Transportation, 1985, *Compensating Auto Accident Victims: A Follow-up Report on No-Fault Insurance Experiences* (Washington, D.C.: U.S. Department of Transportation).
- U.S. National Highway Traffic Safety Administration, 1983, *Code of Federal Regulation*, 40CFR571, October 19 (Washington, D.C.: U.S. Government Printing Office).
- Vetri, Dominick, 1987, The Integration of Tort Law Reforms and Liability Insurance Ratemaking in the New Age, *Oregon Law Review*, 66: 277-301.
- Williamson, Oliver E., 1985, *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting* (New York: Free Press).
- Wilson, R. A. and S. M. Savage, 1973, *Restraint System Effectiveness—A Study of Fatal Accidents* (Warren, Mich.: Automotive Safety Seminar, GM Training Center, June 20-21).

- Wilson, William B., 1979, *Seatbelt Usage Attitudinal Study, A Report for the National Highway Traffic Safety Administration* (McLean, Va.: Teknokron).
- Zador, P. and M. Ciccone, 1991, *Driver Fatalities in Frontal Impacts: Comparisons Between Cars with Airbags and Manual Belts* (Arlington, Va.: Insurance Institute for Highway Safety).

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