THE AIR BAG/SEAT BELT CONTROVERSY: HOW THE STATES VOTED

Robert Kneuper
Federal Trade Commission

and

Bruce Yandle
Clemson University and PERC

INTRODUCTION

Today, air bags are either standard equipment or a popular option on most automobiles. Voter-approved, mandatory state seat belt laws also span the country. With this apparent strong demand for auto safety, it is hard to remember the grueling regulatory process of the 1970s that attempted to force feed air bags to U.S. consumers, partly at the expense of infrequently used seat belts. It is even more difficult to recall that the states were eventually handed the air bag/seat belt hot potato and required to make an up or down vote on air bags versus state-enforced mandatory seat belt laws. Along the way, air bags became an icon of safety [Peterson, Hoffer and Millner, 1985, 252].

The episode began in 1970 when the National Highway Traffic Safety Administration (NHTSA) announced a rule that required all new autos to have passive restraints by 1 January 1973. The NHTSA rule, which quickly became associated with air bags, raised the ire of members of the auto industry, who had tried mightily, but unsuccessfully, to sell bag-equipped cars in the free market [Rowson, 1975]. The rule just as quickly gained the support of auto insurers, who then became major airbag advocates [Kneuper and Yandle, 1994]. A media campaign ensued, sending a publicly-approved message that equated air bags with safety [Gallup, 1984].

The bitter struggle that resulted led to court-imposed delays, legislative intervention, and finally a Reagan campaign promise to bring regulatory relief to the U.S. auto industry. In 1983, a full ten years after the original rule was to go into effect, Reagan administration officials tried unsuccessfully to rescind the airbag mandate. Declaring the rescission to be "arbitrary and capricious," the federal court remanded the decision to the Department of Transportation. In response, then-Secretary of Transportation Elizabeth Dole made an unusual regulatory move that embraced the Reagan Administration's push for federalism while satisfying the safety lobby's demand for federal action [Graham, 1985]. Calling on the states to settle the matter, Secretary Dole announced that all newly-produced cars sold in the U.S. would have to be equipped with passive restraints (air bags) by September 1989, unless two-thirds


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purchase a particular legislative package [Tollison, 1983]. The stylized politician/broker responds by providing favors to the highest bidder. The mass of unorganized, rationally ignorant voters who elect politicians play only a passive role in the struggle; well-organized interest groups carry the day when legislation is written and passed. Recently, Brennan and Lomasky [1993] have challenged the underpinnings of this orthodox explanation, arguing that the votes of ordinary people must still be accounted for, especially in general reference. The enriched model posited by Brennan and Lomasky identifies two kinds of political preferences held by individuals involved in a political struggle: (1) instrumental preferences that are conditioned by opportunity cost, because the legislative outcome directly affects the individual's wealth; and (2) expressive preferences that map into socially-approved values and popular icons like auto safety. Expressive preferences, which unguided can run counter to the wishes of special interest groups, dominate when wealth is not affected. The disinterested, expressive voter is seen to relish the opportunity to make value statements in the voting booth; doing so carries zero opportunity cost.

Brennan and Lomasky point out that orthodox public choice can explain "those aspects of policy that depend on relative costs" but "cannot explain the 'demand' side of electoral politics, and hence it cannot explain ... why overall policy is what it is" [ibid., 88]. In short, Brennan and Lomasky challenge the public-choice analyst to deal with two important elements of the electorate: those who have a direct economic stake in an outcome and other active voters who may express values that affect outcomes.

In analyzing the positions taken in response to the Dole decision, we examine mandatory seatbelt outcomes across the 50 states through August 1987. Our estimating model blends orthodox and expressive considerations to see whether legislators are indirectly affected by expressive voting. We argue that successful legislators — those who are reelected — are capable brokers who balance the competing demands of special interests while signalling their commitment to important social icons. That is, the legislator's vote reflects a balancing of wealth transfers filtered by compatible voter preferences that could be expressed in the unconstrained setting of the voting booth [McCormick and Tollison, 1981, 18-22].

In the expanded model, the successful legislator maintains voter support through a costly process that transforms campaign contributions, C, into compatible expressive messages, E, that continuously attract broad voter supporter: \( B = B(C) \). The legislator must satisfy the orthodox voters who are the source of contributions and have a well-defined economic interest in the politician's actions while appealing simultaneously to social values that can be expressed in the polling place. In equilibrium, the legislator must cover the marginal cost of his brokering activity, which we assume constant, \( MC = B \).

The legislator's utility function is written in terms of expected lifetime income, the discounted value of net campaign contributions that determines wealth, \( U \). Utility is written \( U = U(W) \). As indicated, \( W \) is determined by the legislator's ability to gain funds net of marginal cost, \( F \), while transforming the contributions of balanced economic interests into votes cast by expressive voters, \( W = WF \). Therefore, the legislator's utility function is written: \( U = U(F|E) \).

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**The Theoretical and Empirical Model.**

The Theory of Legislative Votes

Public choice analysis of regulatory outcomes, which for convenience we term orthodox, focuses on the special interest theory of government in which well-specified economic agents are described as though they were involved in a political struggle to
A majority outcome among legislators is characterized by an equilibrium in which the marginal cost of transforming contributions into compatible expressive votes is equal to the summed marginal benefits of special interest group net winners. Of course, it is possible that all net gains, other than for the political brokers, will be dissipated in the struggle (Tullock, 1967; Wenders, 1987).

The Empirical Model

We apply the empirical counterpart of the theoretical model to legislative seatbelt votes taken in the mid- to late 1980s. Our estimating model uses a simple zero-one dependent variable that marks the outcome of mandatory seat belt votes across all 50 states from period July 1984 to August 1987, the post-Dole period. In all, 31 states passed mandatory belt laws during that period, and 19 states debated but failed to pass statutes. The former were designated with a one and the latter with a zero. We assume legislative majorities that acted to pass or reject legislation reflect the theoretical model just presented.

The general form of the statistical model, estimated as a probit, contains proxies for instrumental and expressive voting, which indirectly determine legislator wealth. Table 1 describes the variable. The general model is written:

\[ \text{LAW} = \beta_{\text{AUTO, INSUR, AIR, EDUC, INC, FATAL, NOF, HIGH, PHYS}}. \]

The first three variables are proxies for narrow interest groups that sought to influence the vote outcome. The coefficient on AUTO, which is the per capita number of auto industry employees by state, is predicted to be positive, supporting the stated position of the auto industry. The bulk of the evidence suggests that, at the time of the votes, airbags were costly and not valued sufficiently by consumers to yield passage while mandatory belt laws would shift compliance costs to state governments.

The coefficient on INSUR, the per capita number of people employed in the insurance industry by state, is predicted to be negative on the basis of the regulatory record (Knepper and Yandle, 1984). Insurers have historically been pro-bag. One explanation for their special interest motivation is that air bags simplify actuarial estimation, since drivers no longer have the choice to use (or not use) physical safety protection, and air bags provide special protection against neck and head injuries, which are often settled in expensive and difficult-to-predict legal battles. State seat belt laws, on the other hand, were predicted to be more effective via-à-vis a national passive restraint mandate would be phased in over time and affect only newly produced autos. AIR is a yes-no dummy variable that proxies for the political influence generated by airbag producers who have plants in particular states, making it less costly for their lobbyists to influence legislators. The coefficient is predicted to be negative.

\[ \text{EDUC} \]

The percent of the population with at least a high-school education, also reflects orthodox voting behavior. Numerous studies of seatbelt use show more highly educated drivers are more frequent users (Robertson, 1976; 1977; 1984; Wilson, 1979), findings that are logical on human-capital grounds. More to the point, mandatory seatbelt laws are costly to those who already use them, and in a collision, belted drivers can be liable for injuries sustained by unbelted occupants of other vehicles. Mandatory state seatbelt laws require those who previously were unbelted to change their behavior, a result that is inversely related to levels of education. We predict the sign on \text{EDUC} to be positive.

\[ \text{INC} \]

For per capita income, INC, forms another instrumental variable. As with education levels, evidence suggests that higher income people buckle their seat belts more frequently (Wilson, 1979, 3.8). Mandatory seatbelt laws are costless to those
who already use belts. On the other hand, mandatory passive restraints impose cost
on those who already "backed up." We predict the coefficient on INC to be positive.
PATAL, the annual fatality rate per mile driven, proxies another activity in which
voters have a stake. While we expect voters in high fatality states to be more expres-
sive about auto safety than in other states, we also recognize that the same voters
face an opportunity cost. Economic gains lie in the balance. States with a perceived
fatality "problem" could be addressed either by federally mandated passive restraints
or state-mandated belt laws. If consumers in high fatality states assign a relatively
high value to marginal reductions of the probability of death and injury in highway
accidents provided by automobile safety devices, the differential effects on fatalities
between a national passive restraint rule and mandatory state seat belts favor the
latter. Gains in safety would be immediate and larger, unless belts were used in
combination with bags.\textsuperscript{11} Quite possibly many consumers do not see the two safety
devices as alternatives, but think of them as working in tandem. We predict the coef-
cient on PATAL to be positive.

Special interest and expressive voting predict a negative sign on the coefficient of
NOF, a dummy variable that adjusts for states with no-fault insurance laws. As we
see it, NOF accounts for preferences that relate to the income/safety tradeoff. Studies
have found that the restricted or removed liability provisions associated with no-
fault states have resulted in an increase in the highway fatality rate (Landes, 1982;
McEwin, 1989; Devlin, 1990), increases in payments per insured motorists (Compensat-
ing Auto Accident Victims, 1985), and decreases in the number of associated court
cases (Compensating Auto Accident Victims, 1985). A vote against state-mandated
belts, which would be effective immediately, is consistent with revealed preference of
NOF states to substitute lower court costs and increased insurance payments for
increased fatalities. Expressive voting that sees air bags as a symbol of enhanced
future auto safety also calls for the same negative coefficient on NOF.

HIGH, state highway expenditures per mile of road, which accounts for popular
support for public highways as indicated by expenditures on alternative public safety
efforts, also enters the model ambiguously. The theory of expressive voting and spe-
cial interest theory predict the same sign for the coefficient. Consider the special
interest story. Research by Schwing (1979) provides a basis for identifying voter
opportunity cost and a special interest argument. He reports the marginal gains in
life expectancy generated by various highway safety programs, including mandatory
seat belts and air bags. Schwing finds mandatory belts to be cost effective, but re-
ports that ambulances, expressway lighting, and emergency helicopters have much
higher safety payoffs. In this sense, HIGH accounts for substitutes for belts and bags.

If cost-effective increases in life expectancy are the objective, the voter must
consider the cost of implementing and enforcing mandatory seatbelt laws borne by
state taxpayers. That cost is positive for mandatory belts, which calls for a negative
sign on the coefficient. Now, consider the expressive vote that simply favors the rhetoric
of airbag safety. The sign on the coefficient favoring air bags should be negative on expressive
grounds as well.

PHYS is the number of physicians per capita and the one variable that we con-
sider to be a pure reflection of expressive voting. That is, we have no special interest
tendency to offer that would explain general voter behavior.\textsuperscript{12} We argue that voters
who demand more health-care services, as reflected by PHYS, will be more expres-
sive about auto safety in the voting booth. Politicians, aware of this, will condition
their voting accordingly. While the scientific debate about air bags versus mandatory
belts indicated the latter were more effective, a strong air bag campaign seemed to
take the safety high ground. Expressive voting predicts a negative sign on PHYS.

In summary, the statistical models contain four categories of variables:

1. those that reflect narrow special interest groups,
2. those that reflect special interest effects for categories of voters,
3. those where the expressive versus special interest effect is ambiguous,
4. one that reflects pure expressive voting.

The Estimates

The results of two estimates are reported in Table 2, where we call particular
attention to Equation (1). The coefficients on AUTO, INSUR, AIR, EDUC, INC, FA-
TAL, and HIGH are significant and carry the predicted signs.\textsuperscript{13} PHYS, the proxy for
expressive voting, is positive, but not significant. In an unreported experiment, we
found PHYS to be significant and positive when INC was excluded, which suggests
PHYS is partly proxying for income. We note that the coefficients on NOF and HIGH
are correctly signed for expressive and instrumental voting. In short, the evidence for
expressive voting and against special interest voting is ambiguous.

Equation (2) reports the estimate without INSUR. We call attention to the higher
level of significance for PATAL, which implies a strong preference for the safety fea-
tures of belts and suggests a linkage between the number of insurance personnel per
capita and average fatalities. (We note that the coefficient on INSUR remains nega-
tive and significant with or without PATAL in the equation.)

A Look at State Seat Belt Laws with Special Provisions

In an extension of our work, we applied the explanatory power of the statistical
model to the content of some of the state seatbelt laws.\textsuperscript{14} The laws had a number of
different features including the level of fines, the degree of enforcement and the num-
ber of exemptions. In fact, the laws of five states actually provided that they could not
be counted towards the national total, while four states' laws would be rescinded if
the two-thirds goal was not met.

States that passed seatbelt laws with provisions excluding them from the overall
count would appear to have a preference for both bags and mandatory belts. In these
states, if the special interest arguments we tested are valid, one would expect to see a
relatively strong insurance lobby, a relatively weak automobile lobby, and an overall
strong preference for safety. The opposite condition should exist in states with the
provision for recission if the two-thirds goal is not met, since these legislatures would
### Table 2
Probit Regression Estimates

<table>
<thead>
<tr>
<th>Dependent Variable: State Seat Belt Votes</th>
<th>Equation 1</th>
<th>Equation 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-16.32669</td>
<td>-16.60911</td>
</tr>
<tr>
<td>AUTO</td>
<td>-2.8109</td>
<td>-2.6177</td>
</tr>
<tr>
<td>INSUR</td>
<td>0.103344</td>
<td>0.121078</td>
</tr>
<tr>
<td>AIR</td>
<td>0.97779</td>
<td>0.97813</td>
</tr>
<tr>
<td>PHYS</td>
<td>0.4590</td>
<td>0.2965</td>
</tr>
<tr>
<td>NOFL</td>
<td>-1.69797</td>
<td>-0.79763</td>
</tr>
<tr>
<td>EDUC</td>
<td>0.15052</td>
<td>0.14040</td>
</tr>
<tr>
<td>HIGH</td>
<td>-0.36526</td>
<td>-0.18508</td>
</tr>
<tr>
<td>FATAL</td>
<td>1.35926</td>
<td>1.35938</td>
</tr>
<tr>
<td>INC</td>
<td>0.000961</td>
<td>0.000968</td>
</tr>
<tr>
<td>Percent Predicted Correct</td>
<td>0.94</td>
<td>0.94</td>
</tr>
</tbody>
</table>

a. Significant at the 95 percent level.

The table shows the coefficients for various independent variables in a probit regression model to predict seat belt adherence. The coefficients indicate the effect of each variable on the probability of a state having a seat belt law in place.

### The Benefits from Lobbying for Mandatory Seat Belt Laws

As a final step in our empirical work, we computed derivatives for each of the independent variables with respect to the probability of a yes vote. (The results are reported in Table 4.) These can be used to estimate the marginal benefits from lobbying by narrow special interest groups. For example, according to our voting estimates, Pennsylvania is one of the most likely states to pass a seat belt law. For purposes of illustration, suppose a particular automaker wanted to calculate the marginal benefits of promoting Pennsylvania a new automobile plant that would increase the number of automobile manufacturer employees in that state by 11,863 (an increase of one automobile manufacturer employee per 1000 Pennsylvanians) if the state legislature will consider passing a mandatory seat belt law.

According to Table 4 the higher automobile employment level would increase the probability of a yes vote in Pennsylvania by approximately 3.2 percent, which translates into an expected increase in the mandatory seat belt covered population of about 0.56 percent (Pennsylvania contains about 5 percent of the total U.S. population.) From this, one could estimate the increase in the probability of meeting the two-thirds threshold and multiply that by the monetary savings from having the passive restraint rule rescinded. The result would be the expected marginal benefits from locating the plant in Pennsylvania which could be compared to the marginal costs from not locating elsewhere (i.e., higher labor costs, less productivity, etc.).

The same approach could be applied to insurance companies and airbag manufacturers. For instance, an insurance company could estimate the expected marginal...
TABLE 4 Derivatives from the Probit Model by State

<table>
<thead>
<tr>
<th>State</th>
<th>AUTO</th>
<th>DISGRU</th>
<th>AIR</th>
<th>PHYS</th>
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<tr>
<td>Alabama</td>
<td>0.035</td>
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<td>0.0045</td>
</tr>
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<td>Alaska</td>
<td>0.15 E-4</td>
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<td>0.0006</td>
<td>0.06 E-5</td>
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<td>Arizona</td>
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<td>California</td>
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<td>-0.60 E-1</td>
<td>-0.31 E-10</td>
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</tr>
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<td>Colorado</td>
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<td>-0.0004</td>
<td>-0.0036</td>
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<td>-0.51 E-4</td>
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<td>-0.0023</td>
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<td>-0.0374</td>
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<td>-0.0621</td>
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<td>0.0158</td>
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<td>0.0026</td>
</tr>
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</table>

private benefits of efforts to overturn an existing state seatbelt law. An airbag manufacturer might want to calculate the marginal benefits from a threat to relocate.

FINAl THOUGHTS

This article examined a rare voting opportunity that came with the airbag/seatbelt struggle of the mid- to late-1980s. The shift of a federal regulatory proceeding to state legislatures provided an opportunity to explore counterforces generated by the special interest groups that fought pro and con and to observe the effects less-organized consumer/citizen interest groups had on the outcome. The new theory of expressive voting was combined with the older special interest theory as we built statistical voting models. Our statistical estimates demonstrated the power of auto, insurance, and airbag interests in influencing the state votes. We note that the coefficients are considerably larger for insurance employees and airbag facilities than for auto employees. We also find that the instrumental preferences of ordinary people, proxied by demographic and other characteristics, weigh heavily in the political balance. We note that the coefficient on highway expenditures, which entered the model as an expressive variable on ambiguous grounds, is especially large. Quite possibly, expressive and orthodox voting combined here to yield a stronger outcome. Only one variable in our model is seen as a pure proxy for expressive voting, and it is not significant.

While we believe our research offers useful insights for those who seek to understand protracted regulatory episodes, we do not consider our work a strong test of expressive voting. We hope that our richer theoretical model and results of our statistical models will prove helpful to future researchers.

NOTES

The authors express appreciation for helpful comments to Dan Bubeck, William Dough, Roger Meiners, Raymond Fleur and to the editor and referees of this journal. Opinions expressed here are those of the authors and do not in any way reflect the views of the Federal Trade Commis- sion or any members of the FTC staff.

1. Manning and Winston [1998] show access to information about the effectiveness of airbags as a major force explaining the increased willingness to pay for air bags. Their evidence is based on hours of TV watching and contacts with other owners of log-equipped cars. Additional forces favoring purchase of bags include the prevalence of lighter, less crashworthy cars, the lower relative cost of airbags, and improved airbag technology (We acknowledge the assis- tance of an anonymous referee for calling this to our attention. For additional background, see Robert Koop and Bruce Yandle [1994]).

2. The passive restraint mandate could be satisfied by mandated blacked bags, or any device that would automatically, without driver action, provide restraint during a collision. Practically speaking, the air bag soon won out as the preferred device.

3. Early on, automakers were sharply divided on the air bag issue. General Motors, an early supporter of air bags, had encountered disaster when the firm listed to market bag-equipped cars in the early 1970s (Bowen, 1978). No matter how the firm advertised and subsidized, consumers would not buy air bags. GM then joined other producers who fought the rulemaking from the beginning.

4. The Dole decision created the incentive needed to force state action. Between 1977-79, more than 110 mandatory seat belt laws had been introduced in state legislatures, but none had passed (Wilson,
1979, 1:3. Following the 1984 Dole announcement, through August 1987, mandatory belt laws were debated in every state, and 31 states passed mandatory seat belt laws.

4. More recently, the federal government has handed over its regulatory authority to the states. For example, the McCarran-Ferguson Act excepted insurance from federal antitrust regulation and encircled the states with bumper-to-bumper state regulations of insurance, but no state had seat belt legislation in 1968.

5. The state of Connecticut, for example, has approved mandatory seat belt legislation but has not yet set a deadline for implementation. The bill requires that all new cars sold in the state be equipped with seat belts.

6. The state of Ohio, on the other hand, has mandated that all vehicles sold in the state be equipped with seat belts. The bill also requires that all new drivers pass a seat belt use test before they can obtain a driver's license.

7. In the state of New York, seat belt use is mandatory for all drivers and passengers. The law was enacted in 1986 and is enforced by the state police.

8. A survey conducted by the National Highway Traffic Safety Administration found that 80% of drivers aged 16-20 were wearing seat belts, compared to 50% of drivers aged 35-44.

9. As of May 1983, 8 states had passed some form of mandatory seat belt legislation. Kentucky, South Dakota, Massachusetts and New Hampshire had yet to pass legislation. Serious questions remain about the effects of these laws on public health and safety.

10. The state of California has implemented a high-visibility enforcement program to encourage seat belt use. The program includes public education campaigns and increased police patrols.

11. A study conducted by the National Highway Traffic Safety Administration found that states with mandatory seat belt laws had a 40% reduction in seat belt use compared to states without such laws.

REFERENCES


HOSPITAL COST AND EFFICIENCY IN
A REGIME OF STRINGENT REGULATION

Donald F. Vitaliano
Rensselaer Polytechnic Institute

Mark Toren
New York State Department of Health

INTRODUCTION

Hospital costs have resumed their upward trend at an unacceptably high rate after having slowed somewhat following the introduction during the mid-1980s of the Medicare Prospective Payment System, which sets payments to hospitals in advance based on the estimated complexity of each medical condition. Pooled in part by rising hospital costs, the cost of the federal government's two main health insurance programs, Medicare for the elderly and Medicaid for the poor, has been rising at well above the general inflation rate. Efforts to balance the federal budget have focused on restraining the growth in health care costs. And a principal component of the effort to restrain costs is restricting reimbursement to hospitals and other health care providers. To a considerable degree, how such restrictions will impact the delivery of health care depends upon the efficiency of the nation's hospitals. Ironically, greater inefficiency means a greater potential to reduce costs without negatively impacting access or quality. Changes in incentive structures, institutional and managerial arrangements, and staffing procedures, for example, are possible ways of adjusting to cuts in funding. However, if hospitals are providing care in a least-cost manner, budget cutting will inevitably lead to a reduction in services.

This paper employs the increasingly popular stochastic frontier regression to estimate the extent of economic inefficiency of 219 general care hospitals in New York during 1991. New York is an interesting benchmark case because it has one of the oldest and most comprehensive systems of hospital and healthcare regulation that includes fixing prices and limiting expansion to control costs [Rodat, 1995]. It is one of a handful of states that comprehensively regulates hospital reimbursement rates, and an analysis of the impact of its policies may help predict the consequences of federal efforts to control costs by restricting reimbursement to hospitals.

The regulatory environment in New York is illustrated by the fact that until recently hospitals were required to report how many vacant beds they had three times a day to the Health Department — even though they were all operating well below capacity. Installation of a new telephone system requires regulatory approval, too.