Experience from early tort reforms: comparative negligence since 1974. (economic aspects of comparative negligence vs. contributory negligence)

By: George B. Flanigan, Joseph E. Johnson, Daniel T. Winkler and William Ferguson.

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Abstract:
Insurance consumers in states that have adopted comparative negligence pay more for automobile liability insurance than do consumers in states that retain contributory negligence. Through the use of a transformed generalized least squares regression model, allowance is made for: no-fault, population density, state-specific price-level, and automobile safety/fatality differences. States with pure comparative have much higher costs than do states with modified comparative negligence; states with modified comparative have higher costs than those with contributory negligence.

The influence of alternative liability rules on the cost of insurance is of public concern. In recent years many states have changed from contributory negligence to either pure or modified comparative negligence. This article examines the cost of automobile insurance under three liability rules. The authors conclude that states with either type of comparative negligence have higher automobile insurance costs.

Article:
Negligence Standards
Contributory negligence provides that in order to be awarded damages, plaintiffs must be free of fault, however slight, in causing those damages. As recently as 1970, 38 states had contributory negligence rules. Only five states retain a contributory negligence tandard. Table 1 lists the states, their changes, and the years those changes were effective.

Under a system of pure comparative negligence, a contributorily negligent plaintiff "may recover even though his negligence was greater than [the] defendant's but his damage award will be reduced in proportion to the amount of negligence attributable to him" [Schwartz, (1986)]. Modified comparative negligence is a compromise between the pure comparative and contributory standards. In practice there is no uniform meaning for modified comparative negligence. Nebraska and South Dakota allow recovery only to negligent plaintiffs who negligence is slight in comparison to the defendant's negligence (known as the "Slight/Gross Rule"). Other states have a "49 Percent Rule" where a plaintiff's contributory negligence will not bar recovery if his or her negligence is less than the defendant's.

Still other states do not bar recovery if the plaintiff is as much as half responsible; (the "50 Percent Rule"). In this study observations are classified as contributory; modified comparative, including slight/gross, 49 percent, and 50 percent; and pure comparative negligence.

Morale Hazard and Liability Rules

Research concerning the efficiency of alternative liability rules has been done by Calabresi (1970), Danzon (1987), and others. Their focus is minimization of the social costs of accidents including: costs of prevention; compensation of injured parties; cost of the legal system; and economic inefficiency from uninsured risk (Danzon, 1987). Choices available to society range from a system where losses are borne by the victim (prudently the victim should buy first-party insurance) to a system of strict liability (also known as absolute liability) where liability without fault is imposed. (1) Between these extremes lies the negligence rule (with contributory negligence) and the comparative negligence rule.

Shavell (1982) examined the interplay of morale hazard with liability rules and the presence of insurance. Clearly insurance reduces safety and accident reduction incentives. Thus, it is possible contributory negligence would have a different effect on loss frequency than would comparative negligence. However, as Shavell points out, it is possible "the availability of liability insurance does not have an undesirable effect on the working of liability rules." This is so even if the presence of liability insurance changes the incentives created by liability rules, because counter incentives encouraging loss control are created by the terms and pricing mechanisms commonly employed in liability insurance (such as experience rating). Rolph, Hammitt, and Houchens (RHH) (1985) contend that claimants and juries scale down claims according to the claimant's degree of negligence. Their findings suggest that the comparative versus contributory choice makes little difference because juries scale awards to degree of negligence and claimants reduce their claims according to the probability of award. RHH looked at closed claims data for only six states, made no allowance for extraneous influences on the level of claims,, and examined data for only 1977. In contrast, this study examines the cost of automobile insurance cross sectionally over 13 years. Moreover, the period is that in which most states changed from contributory to comparative negligence rules.

The insurance premium includes factors representing each of the social costs of accidents, although it cannot be argued that the insurance mechanism absorbs all accident costs. Insurance premiums include some of the cost of loss prevention. (2) Liability insurance contracts include the defendant's legal costs. Likewise it is presumed that awards or settlements include a plaintiff's legal costs. Indeed, it is strongly argued by the plaintiff bar that the contingency fee system meets social equity goals by providing access to the judicial system. Finally, even with the existence of insurance, there will almost certainly be a residual disutility not captured in the insurance premium due to inadequate limits and uninsured persons.

Research Objective

The research purpose is to identify and measure any automobile insurance cost differentials between negligence standards. Only the cost of automobile insurance is cosidered. Attitude differences, safety implications, and administrative costs that are not included in the insurance premium are beyond the scope of this article. No effort is made to measure the benefits of the negligence systems; only the costs are measured. (3)

Complete yearly statistical data on automobile insurance losses are available from 1974 to 1986 for 47 states for the dependent and all independent variables. (4) These data permit the comparison of automobile insurance loss costs between states.

Dependent Variables

Two dependent variables were used: total system bodily injury pure premium (BIPP), including basic and excess liability limits, medical payments, and uninsured motorist protection; and total system bodily injury and property damage pure premium (BIPDPP). The dates in Table 1 have been used to sort cost observations between the three negligence standards. Although only five states continue to have contributory negligence, the majority of states with comparative negligence standards adopted those standards during the period defined by the data.

Independent Variables

The explanatory independent variables used in this study control for extraneous effects. These variables are whether or not the state has no fault insurance, the state's relative population density, interstate and time trend differences in the price level (using manufacturing wages as a proxy), and the relative safety and driving conditions in the 47 states. Each of the independent variables is discussed later.

The null hypothesis tested is that comparative negligence standards, either pure or modified, have had no effect on the cost of automobile insurance.

Research Methods

The states were classified as traditionals fault states or no-fault states. The classification of no fault states included true no fault states, add-on no-fault states, and optional no fault states [Flanigan, Johnson, and Weeks (1985)]. The existence of no-fault is expected to lead to higher automobile insurance costs. [Flanigan, Johnson, and Weeks (1985) and Johnson, Flanigan, and Weeks (1983)]. The second extraneous independent variable is population density per square mile. (5) This variable serves as a proxy for traffic congestion. One would expect fewer and less severe bodily injury losses in states with less traffic congestion. Therefore, higher premiums are expected in states with a higher population concentration. A third extraneous independent variable is a proxy for the differing price level effects between states. Because there is no index of price level by state, the chosen proxy is average hourly manufacturing wages. (6) The hourly wage variable controls for cross-sectional differences in the cost of living between states and for prices changes over time. (7) A final independent variable is motor vehicle fatalities per registered vehicle. This variable is a proxy for environmental safety in each state, including factors such as the safety of roads, traffic laws and regulations, and quality of driver education programs. (8)

The pure premium for the automobile insurance ([Y.sub.it]) is estimated by the following model: [Y.sub.it] = [alpha] + [[beta].sub.1.X.sub.1it] + [[beta].sub.2.X.sub.2it' + [[beta].sub.3.X.sub.3it] + [[beta].sub.4.X.sub.4it] + [[beta].sub.5.X.sub.5it] + [[beta].sub.6.X.sub.6it] + [[epsilon].sub.it] where:

i = state i observation t = year t observation [X.sub.1it] = Dummy variable for the modified comparative negligence system (1 if modified, 0 if other) [X.sub.2it] = Dummy variable for the pure comparative negligence system (1 if pure, 0 if other) [X.sub.3it] = Dummy variable for the traditional fault or no fault system (1 if no fault, 0 if fault) [X.sub.4it] = Population per square mile [X.sub.5it] = Average hourly earning per hour [X.sub.6it] = Motor vehicle fatalities per registration [[epsilon].sub.it] = Disturbance term

The independent variable regression coefficients estimate the impact of each independent variable on the automobile insurance pure premium. (9)

Results

The results of the ordinary least squares (OLS) model are shown in Table 2. (10) The F-values for BIPDBB and BIPP are highly significant at .001. For the OLS equation, however, the very low Durbin-Watson statistic indicates the presence of positive first-order serial correlation. (11) A time series auto-correlation model is appropriate in the presence of auto-correlated time-series disturbances. A two-step generalized least squares method is utilized. In the first step ordinary least squares is used to estimate the parameter coefficient matrix and to estimate the fitted residuals. The auto-regressive characteristics are removed by estimating the first-order regressive parameters for each state. These parameters remove the serial correlation. OLS is applied to the transformed model to estimate the new covariance matrix. Finally generalized least squares (GLS) is utilized to obtain consistent and efficient estimators [Parks (1967) and Pindyck and Rubinfeld (1981)].

Table 3 shows the results of the transformed GLS model after correcting for serial correlation in the data. (12) The resulting Durbin-Watson statistics of 1.85 and 1.87, respectively, indicate the successful removal of serial correlation from the OLS regression. The economic and demographic variables are all significant and have the predicted signs. The modified and pure comparative negligence parameters are positive and highly significant at 0.05 and 0.001 levels for BIPP. For BIPDPP the pure variable is still significant at .001, although the modified variable is marginally not significant. As would be expected, the impact of comparative negligence changes on property damage losses is not as significant as for bodily injury losses. The relatively small claim severity in property damage as compared to bodily injury suggests the change would impact BIPDPP less significantly. The coefficient for states with pure comparative negligence standards is greater than that for states with modified standards. This finding is expected since the pure system permits even the plaintiff who is primarily at fault to recover damages. These results suggest average cost differentials of $3.02 for modified negligence and $7.17 for pure negligence above the average BIPP premium for contributory states from 1974 to 1986. These cost differentials translate to respective increases of 5.07 percent and 12.05 percent for the modified and pure standards over the contributory standard from 1974 to 1986.

Summary and Conclusions

These data indicate that states with comparative negligence standards have higher automobile insurance costs. The research findings clearly indicate that those states which retain contributory negligence should undertake a change only after recognizing the ccost differentials. It should be emphasized that this study considers only automobile insurance costs. The qualitative arguments

in favor of comparative negligence standards are compelling and may outweigh the costs identified here.

(1) Legally, strict liability is the rule applicable to products liability, meaning products liability without negligence or design flaw, given the presence of a defect. The common law rule of absolute liability more closely resembles strict liability as it is used in the referenced literature.

(2) In some lines of insurance (e.g. boiler and machinery, elevator liability) the cost of loss prevention constitutes a major portion of the insurance premium. This is true in workers' compensation.

(3) It must be acknowledged that costs can be shifted under contributory negligence resulting in lower auto premiums but higher costs of employee benefit plans, public welfare, and even workers compensation. On the other hand, total insurance premiums are used instead of basic limits, and medical payments and uninsured motorist premiums are included in the BIPP variable. Thus, if shifts have occurred within the automobile insurance system, it is simply a transfer within the total insurance program.

(4) The 47 states are those that report to the Insurance Services Office. There are no missing data during this time period. Prior to 1974, data are missing for eight additional states.

(5) Other measures of traffic concentration include population per mile of highway and car registrations per mile of highway. These have a Pearson correlation coefficient with population per square mile of 96.89 percent and 97.95 percent respectively. It can be argued that population is a better proxy than cars. Number of cars overlooks the pedestrian traffic factor. An area with the same number of car registrations but higher population would have a greater exposure. Furthermore, using population per square mile has precedence in the literature. [Flanigan, Johnson, and Weeks (1985) and Johnson, Flanigan, and Weeks (1983)].

(6) Better proxies for state price level such as automobile repair costs and medical costs are available; unfortunately, data are not consistently available from 1974-1986. However, per capita income is consistently available. Per capita income has a 90.97 percent correlation with manufacturing wages, but has the disadvantage of including transfer payments. Moreover, regressin results are substantially unchanged when per capita income is substituted for manufacturing wages.

(7) Specifically, the addition of average hourly earnings permits an estimation of the premium differentials of the modified and pure comparative standards over the contributory standard, holding the price level constant.

(8) Fatalities per vehicle should be highly correlated with the number of accidents per vehicle. Another possible proxy for environmental safety in each state is dollars spent on road repair per mile of highway. Dollars spent on road repair, however, is more likely correlated with road usage than with automobile insurance premiums. Likewise, proxies such as whether or not driver education is required in schools do not measure the quality of drivers education. Similarly, the legal driving age does not necessarily correspond with drinking age, or drinking age by type of

intoxicant, and the legal intoxication limit varies by state. Lastly, even if these precautions are present, the actual enforcement of the law varies among states. The end result of these factors should be captured by the number of fatal accidents per auto registration.

(9) The modified negligence partial parameter (=beta.sub.2]) indicates the mean cost from 1974-86 of changing from contributory to the modified standard, holding constant the tort vs. no fault system, population density, average hourly earnings and environmental conditions. Similarly, the pure negligence partial parameter ([beta.sub.2]) shows the average cost of changing from a contributory to a pure negligence standard, holding constant all other independent variables.

(10) A time-trend analysis indicates an average yearly growth rate of pure premiums between 7 and 9 percent for each of the three negligence systems. The mean pure premiums among the reference systems show slight convergence of modified and pure premiums and divergence between comparative negligence premiums and contributory negligence premiums. An analysis of the pure error and lack of fit deviations indicate the test regression function to be linear.

(11) In this study, a trend in premiums results from high inflation during 1974-81. This trend leads to an OLS regression model which carries forward the errors of premiums from one year to the subsequent year. Serially correlated data also cause a loss of efficiency of the least squares, but does not effect their unbiasedness or consistency. The explained variability of the regression is often overestimated and estimates of the standard errors will be smaller than the true standard errors. The solution employed in this study involves estimating the trend of the error terms for each cross-sectional unit, correcting for the error trend in the data, and applying generalized least squares to be transformed data.

(12) The standardized variance-covariance parameter matrix indicates no serious multicollinearity among the variables. The Parks transformed regression model adjusts for heteroscedastic disturbances.

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