

No Fault vs Tort Insurance Schemes: A Survey of the Empirical Evidence

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Executive Summary

The purpose of this study is to review the literature concerned with the introduction of no-fault automobile insurance, and in particular to review the work in which there was some element of statistical or quantitative analysis of the impact of no-fault insurance. Two issues have been addressed. One is the impact, if any, of no-fault automobile insurance on the number of serious motor vehicle accidents. The second is the impact, if any, of no-fault insurance on the levels or rates of increase of motor vehicle insurance premiums.

Two Canadian studies were reviewed. Both were concerned with the impact of no-fault on accident rates, and both were based on data from the Province of Quebec where a “pure no-fault system” (no right to sue for economic loss arising from bodily injury in a motor vehicle accident) was introduced in 1978. Both studies found significant increases in the rates of serious accidents after the introduction of no-fault. The increase in the number of fatal accidents was found to be in the range of 6.8% to 9.6%. The rate of accidents involving bodily injury was found to increase by 10%, when the “reporting effect” was excluded. The expression “reporting effect” refers to the increase in the number of accidents which are reported under a no-fault system, as a result of the absence of any assessment of fault. Reporting effect increases do not reflect an increase in the actual number of accidents.

Pure no-fault insurance systems were introduced in the Northern Territory (Australia) and in New Zealand. A comprehensive statistical analysis found fatal accident rates increased by up to 16% after introduction of no-fault. An article which looked only at New Zealand found lower fatality rates in the years after introduction of no-fault. However, this study did not use statistical techniques that could distinguish the effects of no-fault from other changes which are likely to have affected fatality rates.

In British Columbia, annual motor vehicle accident fatalities number about 500 per year and bodily injury claims which involve some payment for loss number about 36,000 per year. The studies based on the experience in Quebec suggest that introduction of a pure no-fault system would increase the number of fatalities by a number in the range of 30 to 50 per year. The number of bodily injury claims (excluding those arising from the reporting effect) would be expected to increase by about 3,600. The evidence from Australia and New Zealand indicates that the increase in the number of fatalities would be much higher.

No-fault systems have recently been introduced in Ontario, Manitoba and Saskatchewan. As none of these systems have been in existence for very long, there is not yet sufficient statistical data to assess their impacts on accident rates. The Ontario system does not appear to have had the anticipated effect of controlling insurance rate premium increases and it is being replaced, with a return to what could be described as a modified tort system.

Five studies concerning the effects of no-fault on accident rates, based on the experience in the United States, were reviewed. There were no cases involving pure no-fault systems. In fact, all of the U.S. states which were studied had introduced “threshold” systems which preserved the right to sue in cases where the loss exceeded a “monetary threshold” or a “verbal threshold”. In many instances the monetary thresholds were very low, which implies that there would be little difference between so-called no-fault states and those with tort systems.

Three U.S. studies found some increase in accident rates associated with the introduction of what could be described as partial no-fault or threshold systems, with estimates of the increases in accident rates ranging from 2% to 15%. Two studies found no significant increases. Given that no U.S. jurisdiction had introduced a pure no-fault system and that in many cases the thresholds were so low as to be virtually meaningless, the findings of no significant influence on accident rates are of doubtful use in a comparison of accident rates in tort and pure no-fault systems.

Five studies which were concerned with the relationship between no-fault insurance and insurance premium costs were reviewed. One study found moderate increases in one jurisdiction (Florida) and a large reduction in another (Massachusetts). Other studies found that no-fault insurance increased premiums and/or total bodily injury loss costs. All studies were based on the experience in U.S. jurisdictions and so once again, their application to a pure no-fault system is doubtful.

Section 1.

No Fault Insurance and Fatal Accidents: Evidence from Canada

Paper under review: Gaudry, M., (1992) 'Measuring the effects of the No Fault 1978 Quebec Automobile Insurance Act with the DRAG Model'. pp. 471-498 in Dionne, G (ed). Contributions to Insurance Economics (Boston MA: Kluwer Academic Publishers).

Overview

This paper examines the evidence concerning the various effects on road safety of the new automobile insurance regime introduced in Quebec on March 1st, 1978. The focus of the paper was the use of a detailed and comprehensive econometric model to estimate the impact of the introduction of no fault insurance on the number of accidents with property damage only, and in terms of the number of accidents with injuries and fatalities. According to the author, the approach taken incorporated

'the most ambitious modeling effort of its kind ever made, or at least the most comprehensive in terms of structure, categories of factors taken into account and parameter estimation technique used'

Gaudry, 1992, pp. 476.

Methodology

The data used for this study is for the period from 1956 to 1982, and reflects monthly observations to measure over 40 explanatory variables, some of which are listed below:

- prices of gasoline and diesel fuels
- price of vehicle maintenance
- quantity of personal and utility vehicles
- proportion of small cars
- proportion of cars equipped with safety belt
- speed limit reduction and compulsory belt use in 1976
- breathalyser law since March, 1973
- demerit point system since March, 1973
- higher penalties since April 1982
- police patrol frequency and strikes

urban transit strikes
intercity bus strikes
proportion of highway in network
urban street maintenance strikes
hot and cold weather
rain and snow
driving license availability
unemployment
automobile insurance regimes
lower driving age (18 to 16)
pregnancy
weekly hours worked
drug consumption
alcohol consumption
employment
shopping
vacation

The estimation used a complex model called DRAG (Demand for Road use, Accidents and their Gravity). Estimation of the econometric models is achieved via the use of Box-Cox transformations. The author points out that this estimation procedure does not necessitate the assumption of the nature of the causal relationships (linear, log linear or multiplicative for example).

Results

The increase in the number of accidents with fatalities associated with the introduction of no-fault insurance is estimated to be 6.8%. Of this increase, 3.3% is attributed to the impact of the introduction of a flat rated premium structure at that time. The number of accidents with injuries as a result of the introduction of no fault insurance was estimated to have increased by 26.3% and the number of accidents with property damage only were estimated to have increased by 11%.

If the effects of the quantitative factors associated with the introduction of no-fault insurance are included (price of maintaining a car, number of licensed drivers per car and the number of cars per

person), Gaudry reports that accidents with fatalities increased by 9.12%, accidents with injuries increased by 24.04%, and accidents with property damage only increased by 9.81% in the year after the introduction of no-fault insurance.

Paper under review: Devlin, R.A., (1992). 'Liability versus No Fault Automobile Insurance Regimes: An Analysis of the Experience in Quebec'. pp. 499-520 in Dionne, G (ed). Contributions to Insurance Economics (Boston MA: Kluwer Academic Publishers).

Overview

In this paper, Devlin examines the impact of the switch to no-fault insurance in Quebec in 1978. In brief, the major changes which took place in Quebec were:

- i) The provider of insurance became public as opposed to private.
- ii) Compensation was based upon no-fault and not upon a liability system of insurance.
- iii) The premium structure across individuals became non-experience rated as opposed to experience rated.

Methodology

Three regression equations were estimated for accidents with the dependent variables being the number of fatal accidents, the number of bodily injury accidents and the number of accidents with property damage only. The data used was for Ontario (1967-1984), and Quebec (1971 to 1984). The independent variables were:

- i) A dummy variable taking the value of one for the period of no-fault insurance in Quebec and zero otherwise.
- ii) The number of male drivers under the age of 25 divided by total drivers lagged by one time period.
- iii) Males drivers under the age of 25 divided by total drivers.
- iv) Lagged total kilometers driven.
- v) A dummy variable denoting the decrease in the minimum drinking age from 21 to 18 in 1971 in both provinces.
- vi) A dummy variable denoting the enforcement of seat belt legislation.

vii) Number of criminal code offenses per licensed driver.

viii) Dummy variable for Quebec observations.

ix) Time trend.

Results

1. Fatal Accidents increased by 9.62% as a result of the switch to no-fault insurance in Quebec, other things being equal. These results are acknowledged to include two moral hazard effects, that associated with non experience rated premiums, and the moral hazard of compensating drivers irrespective of fault. The author acknowledges that data limitations prevent these two factors being distinguished in the analysis.

2. The increase in bodily injuries was estimated to be 27% after no fault was introduced. Devlin estimated that 17% of this increase was because of a 'reporting effect' (under no-fault insurance drivers are not penalized for reporting an accident as bodily injury or property damage, and may be compensated). Therefore, the increase in bodily injuries after the introduction of no-fault insurance, after controlling for reporting effects, is estimated to be approximately 10%.

3. The increase in property damage as a result of the increase in no-fault insurance in Quebec is estimated at 5.33%.

Commentary

As pointed out by Trebilcock and Chapman (1990), the regression model adopted by Devlin controls for kilometers driven and the proportion of young males drivers in the population, but not for the elimination of experience rating under the Quebec scheme. As such, it difficult to say whether or not the reduction in drivers care is a result of the change in the structure of insurance premiums or the abolition of tort liability. Devlin addresses this point in her article. Furthermore, lagrange multiplier tests were carried out to ensure that the equations were specified correctly. The opinion of this author is that the work completed by Devlin is of a high standard and appears to capture many of the factors that should be controlled for in examining the impact of no-fault legislation. Perhaps a variable to account for population density may have been included in the analysis.

Section 1.2

No Fault Insurance and Fatal Accidents: Evidence from the United States

Paper under review: Landes, E.M., (1982). 'Insurance, Liability and Accidents: A Theoretical and Empirical Investigation of the Effect of No-Fault on Accidents'. Journal of Law and Economics, XXV, pp. 49-65.

Overview

This paper investigates car accident deaths by state, comparing states that have introduced no fault insurance (or a form of no fault insurance) with the states that have not introduced no fault insurance. Data was used for the period from 1967 to 1976 for fifty one states (including the district of Columbia being defined as a 'state'). This data set included the fifteen states which had introduced no-fault laws by 1975.

Methodology

The approach adopted was to run regression equations to explain the number of fatal accidents with the independent variables being:

- i) A dummy variable equal to the value of 1 in any year in which a state had a true no fault plan in effect, and zero otherwise.
- ii) A dummy variable equal to the value of 1 in the first full year in which a no fault plan was in effect, and zero otherwise.
- iii) Variables to account for age, race and sex (not described fully in the paper).
- iv) State population.
- v) State density.
- vi) Dollar medical expense threshold (or the medical expense threshold deflated by a medical price index) or
- vii) The proportion of insurance claims barred from tort recovery by states' tort threshold or
- viii) The proportion of insurance claims barred from tort recovery by state's tort threshold.

Note that three regression runs were reported: these included one of the variables listed as vi, vii and viii.

After the initial regression runs were estimated, a further set of equations were estimated with the level of stringency as the independent variable in the analysis, and the number of fatal accidents as the dependent variable. Landes reported that except for the states with a very low tort threshold (\$200), no fault insurance implies an increase in the number of fatal accidents.

Results

1. In states where a moderate restriction on tort suits was in place, between 2 to 5% more fatal accidents are estimated to have taken place as a result of adopting no fault insurance.
2. The states where more restrictive no fault laws were introduced experienced as many as 10 to 15% more fatal accidents in comparison to the states which did not introduce no fault insurance.

Commentary

Two separate articles have been published in response to the article authored by Landes. Zador and Lund (1986) suggest that the methodology adopted by Landes was flawed on two grounds. First, Landes estimated the effect on fatal accidents as a function of the dummy variable for no fault/fault insurance and the level of stringency as measured by the threshold. However, the analysis by Landes yielded a negative coefficient for the dummy variable which indicated whether or not the presence of no fault increased fatal accidents. This is interpreted as meaning that no fault insurance **decreases** fatal accidents, which was not the thrust of the Landes article.

Second, Zador and Lund suggest that the approach used by Landes to re-estimate the effect of fatal accidents using the same data set was statistically incorrect. According to these authors, a second data set should have been used for this exercise. Further, O'Connell and Levmore (1983) point out that a fundamental flaw exists with the Landes study. The argument presented by these authors is that Landes should not have taken the step of estimating fatal accidents as a function of no fault thresholds. The reason for this being that in all states, regardless of the insurance regime in force, the thresholds in place are exceeded in instances where death occurs. Therefore the rational driver should be equally careful in his or her driving practices given that an accident causing death will result in penalties whether or not no fault insurance is in place. The authors suggest that studies designed to examine the effects of the influence of no-fault insurance should use data on the number of crashes that take place in which the boundaries of no-fault insurance operate. It is noted that Landes did acknowledge this point, but stated that data limitations were too great to conduct a study in this vein.

Finally, O'Connell and Levmore point out that the econometric specification adopted by Landes does not include any variables to measure the influence of police safety activity, weather conditions, road quality, driver training, and urban rural differences.

Paper under review: Zador, P. and Lund, A., (1986) 'Re-Analysis of the Effects of No Fault Automobile Insurance on Fatal Crashes'. Journal of Risk and Insurance, 53:2 pp. 226-241.

Overview

Further to the paper by Landes (1982) this article re-examined the U.S. experience of no-fault insurance that was introduced in 16 states between 1967 and 1980. Using data from 1967 to 1980, and, following the work of Landes, the data set included 50 states and the District of Columbia. It is noted that this data set was extended by four years in comparison to that used by Landes.

Methodology

Multiple regression equations were used for two time periods (1967-1980) and, to enable comparison to the results of Landes, for the period 1967 to 1975. The following variables were used:

Equation 1: Dependent variable: Number of Fatal Accidents

Independent variables: population, population density/square mile, a dummy variable to represent the proportion of the year for which the state had no fault insurance, variables for the state and year.

Equation 2: Dependent Variable: Number of fatal accidents.

Independent variables: population, population density/square mile, a dummy variable to represent the proportion of the year for which the state had no fault insurance of low overall stringency in force, a dummy variable to represent the proportion of the year for which the state had no fault insurance of high overall stringency in force, variables for the state and year and variables to reflect the grouping of states into four geographic regions (West, Midwest, Southeast and Northeast).

Results

The estimates of the variables representing the two dummy variables suggested that the effect of no-fault auto insurance did not increase the number of fatal car crashes. (In only one of 14

regression runs was the effect of no-fault insurance found to be statistically significant). In this instance, the estimated coefficient of the dummy variable was negative suggesting the introduction of no-fault laws decreased fatal accidents.

Commentary

The model estimated by Zador and Lund does appear somewhat simplistic in that a number of potentially important variables are not included in the analysis. For example, variables to represent environmental factors (weather, quality of the roads), police enforcement (convictions for drink driving or speeding) and the characteristics of the driving population (in terms of their age distribution for example) are absent in this article.

Paper under review: Kochanowski, P.S. and Young, M.V., (1985). 'Deterrent Aspects of No Fault Automobile Insurance: Some Empirical Findings'. *Journal of Risk and Insurance*, 52, pp. 269-288.

Overview

In this study, the authors examine the effect of no fault insurance using cross sectional data for the United States for the years 1975, 1976 and 1977.

Methodology

The authors estimated an econometric equation with the dependent variable being the number of traffic fatalities per vehicle miles in the each state. This ratio is a proxy for the probability for the probability of a fatal accident taking place in a given state.

The independent variables were listed as follows:

A vector of variables to measure the characteristics of licensed drivers in each state and environmental factors present in each state.

Variables to capture these factors were age, sex, per capita alcohol consumption, arrests for speeding, arrests for drinking under the influence of alcohol, population density, and the percentage of drivers exceeding the speed limit.

A vector of characteristics to capture the insurance characteristics of each state. A dummy variable was included which took the value of one for states which had no fault insurance and add on

insurance (for personal injury protection) insurance and was zero otherwise. Also, a dummy variable was introduced taking the value of one if the state had adopted pure no-fault insurance and zero otherwise. A third dummy variable was introduced to represent the states that had add-on insurance, with the remaining states being assigned the value of zero, and, finally, a variable was included which represented the percentage of personal injury protection claims made ineligible for tort claim by the imposed threshold.

Results

The findings of this paper provide no evidence that the introduction of no fault insurance have increased fatality rates. The estimated coefficients for the dummy variables included to reflect the insurance regime in each state were not statistically significant at the usual level of acceptance.

Paper under review: Knoeber, C. (1978) 'Penalties and Compensation For Auto Accidents'. The Journal of Legal Studies, pp. 263-278.

Overview

This paper contains a model of driver behavior which the author tests by applying it to the experience of Massachusetts and Manitoba. Although this model is not pertinent for this survey, the paper does contain data on the pre and post experience of no fault insurance in Manitoba and Massachusetts. Manitoba introduced public insurance in November, 1971 (prohibiting private insurance) and adopted a no-fault law for minor accidents at the same time. This insurance regime allowed each party to make a claim on his/her own insurance company in the event of minor accidents, and, for more serious accidents, the non offender can file a tort suit against the offender (make a claim on the offender's insurance company). Massachusetts introduced no fault insurance on January 1st, 1971.

Massachusetts Data

Year	Offenses		Total Accidents		
	Number	Rate	Number	Rate	Accidents/Offenses
1967	349,758	12,543	131,938	4,728	0.3772
1968	408,848	14,345	137,661	4,830	0.3367
1969	439,592	15,154	155,436	5,358	0.3536
1970	440,732	14,732	168,994	5,657	0.3834
1971	427,251	13,961	154,714	5,056	0.3621
1972	498,684	15,877	162,911	5,187	0.3267
1973	578,541	18,029	161,674	5,038	0.2795

Source: The Massachusetts Registry of Motor Vehicles. All rates are calculated per 100,000 licensed drivers.

The raw data suggest that the introduction of no-fault in 1971 coincided with a sharp reduction in the number and rate of accidents relative to the year before the introduction of no-fault. The above table also shows the number of offenses fell sharply in 1971 but increased in the period to 1973.

Manitoba Data

Year	Offenses		Total Accidents		
	Number	Rate	Number	Rate	Accidents/Offenses
1967	69,674	17,639	19,801	5,008	0.2842
1968	74,359	17,234	20,262	4,696	0.2725
1969	73,101	17,282	24,144	5,704	0.3303
1970	67,755	15,416	25,952	5,910	0.3830
1971	64,518	13,490	23,282	4,865	0.3609
1972	66,520	14,977	32,999	7,425	0.4961

Source: Statistics Canada, Judicial Division. Traffic Enforcement Statistics, tabs II P & II G (1967-72). All rates are calculated per 100,000 licensed drivers.

The above table suggests that, following the introduction of no-fault insurance in Manitoba, both accident rates (53%) and offense rates (11%) increased substantially. Of additional interest is

the fact that the accident rate increased at a much lower rate in Canada as a whole in 1972 (5.2%) relative to 1971. Knoeber attributes the differing experience of Manitoba and Massachusetts as being explained by the fact that the public insurance scheme in Manitoba did not base its premiums on the past experience of the insured drivers. Further, there may have been a 'reporting effect' in Manitoba. Accidents are more likely to be recorded if the driver does not face increased insurance premiums.

Paper under review: Medoff, M. and Magaddino, J. (1982) 'An Empirical Analysis of No-Fault Insurance'. Evaluation Review, Vol. 6, No. 3, June 1982 pp. 373-392.

Overview

This article provides empirical evidence as to whether there is any significant difference in the deterrent effects between no-fault insurance and the tort liability system. The approach taken was to use cross section data for the year 1977 to estimate a multiple linear regression model. Although not explicitly stated, it is believed that the study included all states.

Methodology

The dependent variable was the loss ratio which is the rate of premium claims weighted by the average claim cost per premium dollar. The loss ratio is calculated as being:

$$\text{Loss Ratio} = \text{Acc} * (\text{NA}/\text{AP}) * \text{ND} \text{ or } \text{Loss Ratio} = (\text{ACC}/\text{AP}) * (\text{NA}/\text{ND}).$$

Where ACC is the average claim cost, NA is the number of accidents, AP is the average premium per insured driver and ND is the number of insured vehicles.

The independent variables were

Average insurance rate for bodily injury, personal injury protection, medical payments, uninsured motorist and property damage coverage by state.

The average number of days the temperature in a state was 32 degrees Fahrenheit or less.

The average number of days of precipitation of 0.01 inches or more in a given state.

The percentage of a state's population residing in a standard metropolitan statistical area.

The percentage of drivers who are male.

The percentage of drivers under the age of 25.

The median earnings of individuals who are 16 years of age or older in each state.

The percentage of vehicles traveling in excess of 55 miles per hour on a level straight section of a state's main rural roads, including the interstate system.

Three dummy variables were included to take into account regional differences. Dummy variables were used for northern states, midwestern states and southern state.

A dummy variable was used for the type of no-fault system in place. Four regression equations were reported in all. Each state was classified according to the type of insurance regime in place. The classifications were mandatory no-fault (all states that have mandated the purchase of automobile liability insurance and no fault coverage and some restriction of the right to sue), compulsory no-fault (states that have compulsory automobile liability insurance and no fault coverage and have either some or no restrictions on the right to sue), all states that have enacted a form of no fault coverage, and 'pure' no fault states representing those states that are thought by the authors to have the most comprehensive no-fault system.

Results

The coefficients of the dummy variables representing pure no fault, mandatory no-fault and compulsory no-fault insurance were statistically significant and positive. The all no-fault dummy variable was positive but not statistically significant. The estimated increase in the loss ratios were 7.44%, 6.31% and 3.96% for pure no-fault states, mandatory no-fault states and compulsory no-fault states respectively. Note that the magnitude of the increases in the loss ratios was contingent upon the degree of comprehensiveness of the insurance regime in each state. The results support the hypothesis that no-fault insurance schemes reduce accident deterrence.

Commentary

The study appears to be comprehensive in terms of the inclusion of a wide variety of explanatory variables. Moreover, the same regression equations were estimated for 1970, with the intention being to test whether or not the states adopting a no-fault system had higher loss ratios before they introduced a no-fault scheme. The dummy variables were found not to be significantly different from zero, meaning that prior to the introduction of no-fault schemes there was no difference between the loss ratios of those states who retained a tort system and those which later adopted a no-fault system.

Section 1.3

No Fault Insurance and Fatal Accidents: Evidence from Australasia.

Paper under review: McEwin, I.R. (1989) 'No Fault and Road Accidents: Some Australasian Evidence'. *International Review of Law and Economics*, 9, pp. 13-24.

Overview

This paper examines the experience in New Zealand which introduced a comprehensive no-fault scheme in 1974, and Australia, where no fault schemes were introduced in Victoria (1974), Tasmania (1976) and Northern Territory (1979). New Zealand and Northern Territory abolished the right to sue for road accident losses under the common law tort of negligence, and Victoria and Tasmania retained this right. The study used pooled cross section and time series data for all Australian states and territories, as well as New Zealand, for the years 1970 to 1981.

Methodology

A number of regression equations were estimated, including linear and log linear specifications and regressions which used different dependent variables. Specifically, the equations were specified as follows:

Dependent Variables: Road Fatalities per head (fatalities include vehicle drivers, motor cyclists, pedal cyclists, passengers, pedestrians and others). Fatalities per kilometer driven and fatalities per motor vehicle were used as alternative dependent variables.

The independent variables included in the regressions were:

A dummy variable taking the value of one in the year following the introduction of no-fault insurance in New Zealand and the Northern Territory (where rights to sue were removed).

A dummy variable taking the value of one in the year following the introduction of no-fault insurance in Victoria and Tasmania (where common law rights to sue were retained).

A measure of Police force strength.

Metropolitan population divided by the total population in each state.

The proportion of divided highways in each state.

The proportion of cars with seat belts fitted in each state.

The proportion of motor cycles.

The total motor vehicle insurance premiums (property and injury) divided by total claims.

The total number of people between 17 and 25 as a proportion of the total population between 17 and 65 years of age.

The real per capital expenditure on beer, wine and spirits.

The level of real average weekly earnings.

The estimated number of kilometers driven.

Results

In 5 of the 6 regression equations estimated, the dummy variable to account for the introduction of no-fault insurance in New Zealand and Victoria was significant and suggested that the abolition of the common law tort of negligence action was associated with a 16% increase in the number of road fatalities per head of population. In addition, the results suggested that states retaining tort did not experience increased fatalities.

Commentary

In this study, McEwin included a host of explanatory variables to explain fatality rates which were not included in some of the other empirical studies reported in this survey. A further advantage of his approach was that different dependent variables were tested, with the results remaining the same for five of the six regressions reported.

Paper under review: Brown, C.(1985) 'Deterrence in Tort and No-Fault: The New Zealand Experience'. California Law Review, 73, pp. 976-1002.

Overview

Brown examined the experience of the introduction of no-fault insurance in New Zealand in 1974. This paper presented the raw statistics on a number of variables for the years before and after the introduction of no-fault insurance. The study contained no rigorous analysis.

Methodology

Unfortunately, Brown conducts only a descriptive analysis in his paper, and presents a set of raw statistics on accidents and fatalities to draw conclusions. Data used was for the years before the introduction of no-fault in 1974 (from 8 to 10 years) and up to 1980 or 1981.

Results

The raw data showed that fatalities, accidents and casualties per hundred million vehicle kilometers were lower in every year from 1974 to 1980 in comparison with the fatality rate in 1973 after the introduction of no-fault insurance.

Commentary

No attempt was made to examine the no fault issue by controlling for a host of factors, noted by the author, which did probably influence the rate of accidents in New Zealand. The author lists such factors as being an introduction of a lower speed limit in 1973, the introduction of seat belts in 1972, new rules on the right of way at intersections being introduced in 1977 and a reduction in the legal limit of alcohol in the blood stream in 1978. In addition, convictions for motor vehicle violations increased over the period from 1973 to 1980. Therefore, no valid conclusions can be drawn from this paper as to how the introduction of no-fault insurance affected accidents and fatalities.

Section 2: No Fault Insurance and Insurance Premiums

Paper to be reviewed: Brainard, C. and Fitzgerald, J. (1974) 'First Year Cost Results Under No-Fault Automobile Insurance: A Comparison of the Florida and Massachusetts Experience'. Journal of Risk and Insurance, pp. 25-39.

Overview

This paper sought to compare the impact of the introduction of no fault insurance in Florida in 1972 on premiums with the experience in Massachusetts which introduced no fault insurance in 1971. The data for Florida was obtained from a sample of participants in the automobile insurance market, which represented approximately 65% of the activity in that sector. The data for Massachusetts was obtained from industry wide tabulations collected by the Massachusetts Rating Bureau.

Results

First Year Cost Results Under No-Fault: Massachusetts compared with Florida

	Massachusetts	Florida
Incurred Losses (Before No Fault)	99.2	67.3
Subtract 'Tort Savings'	68.9	16.4
Add Personal Injury Protection Add-on Costs	18.5	28.2
Incurred 'Losses' After No Fault	48.8	79.1
Change	-51%	+17%
Pure Premiums:		
Before No Fault	50.61	36.96
After No Fault	24.21	40.66
Change	-52%	+10%

Source: Brainard, C. and Fitzgerald, J. (1974) 'First Year Cost Results Under No-Fault Automobile Insurance, Journal of Risk and Insurance, pp. 37.

Definitions and Terms

Loss Costs are incurred total limits losses including allocated claim adjustment expenses for bodily injury liability. Pure premiums are calculated as incurred losses divided by earned exposures (exposures being the number insured).

The above table suggests that the introduction of no fault insurance had the opposite effect on incurred losses and pure premiums in the two states under consideration. The authors point out that the threshold for Florida was \$1,000 in comparison to \$500 for Massachusetts. One of the reasons for the results noted above is that Florida experienced an increase of 15% in exposures compared with the increase in exposures being just 3% in Massachusetts after the introduction of no fault insurance.

Commentary

The first concern about these findings centres on the quality of the data available for Florida. Unlike Massachusetts, which were calculated under a single, mandated statistical plan, the Florida data was collected by a direct survey of insurance providers. Criticism of the Brainard and Fitzgerald analysis was made by Todd (1976), who pointed out that any meaningful comparison between costs and premiums should include the impact of medical payments claims expenses. Given that Brainard and Fitzgerald omitted this factor, their results only hold if the quantity and dollar value of claims made by insurance companies under both of the insurance systems are the same.

Furthermore, Todd also argued that one should account for the impact of attorney fees and the impact of a change in no fault insurance on other insurance products if one is to gain a truly accurate insight into how no fault insurance impacts upon premiums.

Paper under review: Flanigan, G., Johnson, J., Winkler, D and Ferguson, W. (1989) 'Experience from Early Tort Reforms: Comparative Negligence Since 1974. The Journal of Risk and Insurance, pp. 525-534.

Overview

This study utilized data for 47 U.S. states between the period from 1974 to 1986. The purpose of the paper was to estimate the impact on car insurance premium differentials between states with different negligence standards.

The authors define contributory negligence to mean that in order to be awarded damages, plaintiffs must be free of fault, however slight in causing those damages. On the other hand, under a system of pure comparative negligence, a contributory 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'.

Two independent variables were used for this analysis; first the total system bodily injury pure premium, including basic and excess liability limits, medical payments, and uninsured motorist protection. The second dependent variable chosen was the total bodily injury and property damage pure premium. The independent variables chosen for this study were

A dummy variable for the modified comparative negligence system (1 if modified, 0 if other).

A dummy variable for the pure comparative negligence system (1 if pure, 0 if other).

A dummy variable for the traditional fault or no fault system (1 if no fault, 0 if fault).

Population per square mile.

Average hourly earnings per hour.

Motor vehicle fatalities per registration.

Results

The conclusions of this paper were that states with comparative negligence standards have higher automobile insurance costs. In addition, the coefficient of the no fault dummy variable indicated that the presence of a no fault scheme serves to increase premiums by between \$5 and \$6 depending on the choice of dependent variable.

Commentary

The methodology adopted in this paper is open to several questions. First of all, the authors adopt a simplistic dummy variable to measure the impact of whether or not a state has a fault or no fault insurance scheme in modeling premiums. Given the myriad of alternative no fault schemes in effect in the United States (in terms of the degree of threshold for example), the interpretation of the estimated coefficient of the dummy variable to account for this factor to infer the impact of no fault insurance on premiums is open to question. Second, one could question the lack of environmental factors in the regression equations reported. Premiums are surely a function of the age profile of the population, the level of law enforcement, the quality of the roads and other characteristics of drivers that are not taken into account in this study.

These factors are attempted to be captured by a single variable which was defined as fatalities per registered vehicle.

Paper under review: Johnson, J., Flanigan, B. and Winkler, D. (1992) 'Cost Implications of No-Fault Automobile Insurance'. The Journal of Risk and Insurance pp. 116-123.

Overview

This study estimates the cost of car insurance under different reparation systems. Using data from 47 U.S. states from 1974 to 1985, the authors employ regression analysis with the dependent variables being the reported bodily injury loss costs and the total bodily injury loss costs. Total bodily injury loss costs consist of losses covered by bodily injury liability, medical payments, uninsured motorist and personal injury protection insurance.

Methodology

The paper categorizes reparation systems into six classes. These are listed below:

Verbal- injured party actions are barred except when permanent injury, death or disfigurement results or when economic losses are uncompensated.

High threshold- injured party actions are only permitted when the dollar amount of economic losses exceed a given amount. In this study, a high threshold is considered to be more than \$1,000.

Low threshold - injured party actions are only permitted when the dollar amount of economic losses exceed a given amount. In this study, a low threshold is considered to be less than or equal to \$1,000.

Compulsory Add On - The tort system is retained but no fault benefits are compulsorily included.

Optional Add On - policy holders must be offered the chance to purchase additional add on no fault benefits with no change in the underlying tort system.

Tort- No limitations on the right to seek recovery in tort and no compulsory or optional add on no fault benefits.

Regressions were estimated with two dependent variables; bodily injury loss costs and total bodily injury related loss costs (this includes bodily injury liability, medical payments, uninsured motorist payments and personal injury protection premiums). The independent variables included in the regression equations were population per square mile, manufacturing wages, and variables to

measure the insurance regime in existence (verbal threshold, high threshold, low threshold, optional add on compulsory add on, and comparative negligence).

Results

The findings showed that states with verbal, low threshold, and high threshold no fault laws have lowered bodily injury liability loss costs. However, when total bodily injury related loss costs are considered, (which includes provision for medical expenses, and personal injury protection), the cost advantage of no-fault systems disappears.

Commentary

The authors point out that the models estimated are admittedly simple, and that selection bias is possible. This arises from the fact some states may have changed to a no fault insurance regime because of increasing costs. If this is true, and the costs cannot be explained by the small number of explanatory variables included in this study, then the coefficients of the no fault dummy variables will be affected.

Paper under review: O'Connell, J and Joost, R., (1986) Giving Motorists A Choice Between Fault and No-Fault Insurance. Virginia Law Review, Vol. 72, pp. 61-89.

Overview

A section of this article compares the performance of fault and no-fault insurance schemes in the United States. Also included in this article are useful data from a study conducted by the Alliance of Insurance Investors (reprinted in a U.S. Department of Transport Study entitled 'Compensating Auto Accident Victims: A follow up report on No-Fault Insurance Experiences (1985).

Results

The table below was computed by the Alliance of American Insurers. The Alliance calculated the average personal injury pure premium in 1982 in 18 states that had no fault insurance laws for a number of years. The Alliance then compared the difference between actual (with no fault) and the

likely (without no fault) rates for the states listed below. The numbers indicating a negative sign suggest that the premiums in 1982 were lower by the amount shown than they would have been without no-fault. A positive (+) sign suggests that the premiums were higher by the amount shown than they would have been if no-fault had not been the automobile insurance law.

**Change in Personal Injury
Insurance Costs Resulting From No- Fault**

Verbal Threshold Only

Florida	-21%
Michigan	-17%
New York	-6%

Dollar Threshold of \$1,000 or more

Hawaii	+37%
Minnesota	-2%
Kentucky	-29%
North Dakota	-19%

Dollar Threshold of less than \$1,000

Pennsylvania (repealed on 10/1/84)	+53%
Colorado (threshold raised to \$2,500 in 1/85)	+15%
Georgia	+15%
Kansas	-9%
Massachusetts	-33%
Utah	-13%
Connecticut	+14%
New Jersey	+65%

No Threshold

Oregon	-8%
Delaware	+17%
Maryland	+26%

In addition, the article by O'Connell and Joost contains data contained in a report conducted by the U.S. Department of Transport in 1985. The table below compares the average premiums in states that have tort insurance, and those which, in the terms of this paper, are 'out of balance' and 'in-balance'. An 'out of balance' no fault law results in higher insurance premiums because the total no fault benefit payments exceed the reduction in tort liability payments.

An 'in-balance' no fault law causes no increase in insurance premiums (adjusted for inflation) because the no-fault benefit payments approximately equal the associated reduction in tort liability payments.

Comparison of 1976 and 1983 Average Premium

Type of State	1976	1983	% Increase
Out of balance No-Fault	\$123.70	\$279.85	126%
In balance No-Fault	\$117.64	\$181.35	54%
Traditional Tort	\$110.16	\$165.43	50%

Source: O'Connell and Joost, (1986) pp. 69.

The reason for the vast increase in premiums in the out of balance states is attributed to the fact that in no fault states, under certain circumstances, victims are allowed to sue and to collect no fault benefits. This is hypothesized to increase total compensation paid to victims and therefore to increase costs. Second, no fault thresholds are possibly providing victims with incentives to inflate their claims to avoid the threshold.

Paper under review: Cummins, J.D. and Weiss, M.A., (1992). 'Incentive Effects of No Fault Automobile Insurance: Evidence from Insurance Claim Data'. pp. 445-470 in Dionne, G (ed). Contributions to Insurance Economics (Boston MA: Kluwer Academic Publishers).

Overview

This study looks at the relationship between no-fault insurance and the frequency of claims for property damage liability and the frequency of collision claims. Quarterly data on claims for the United States were used from 1975 to 1992 and were originally compiled by the National Association of Independent Insurers.

Methodology

Econometric equations were used to estimate the frequency of both collision claims and property damage claims as a function of the following independent variables:

- i) A variable to measure the probability of adopting no-fault insurance (estimated earlier in the paper using probit analysis).
- ii) A dummy variable taking the value of 1 if the state has an add-on law and zero otherwise.

- iii) Snowfall in inches per year.
- iv) miles of urban roadway/total miles of roadway.
- v) Alcohol consumption in gallons per capita.
- vi) Population percentage over 17 years.
- vii) Percentage of new car sales/auto registrations.
- viii) Percent of insured autos in the residual market.

Results

No fault insurance changes the incentive structure with regard to filing liability claims, resulting in a substitution of collision for property damage liability claims in no fault states. In addition total property claims frequency is higher in no-fault states. This implies that the accident rates are higher under no-fault.

States with the Highest Growth in Average Liability Premiums 1989-1994

As the table below indicates, of the fifteen states that had the highest increase in average liability premiums in the period from 1989 to 1994, ten had some form of no-fault insurance scheme in operation.

State	Insurance Regime	Increase in Average Liability Premiums
Texas	optional no-fault	69%
Massachusetts	mandatory no fault	68.9%
South Dakota	mandatory no fault	64.2%
Nebraska	tort	63.7%
Utah	mandatory no fault	59.2%
Hawaii	mandatory no fault	63.7%
West Virginia	tort	57.6%
Kentucky	optional no-fault	57.2%
New Mexico	tort	52.2%
Rhode Island	tort	50%
Colorado	mandatory no fault	49.8%
New York	mandatory no fault	49.2%
Arkansas	optional no-fault	47.1%
Delaware	optional no-fault	46.9%
Wyoming	tort	46%

Source: Consumer Attorneys of California, 1996

Paper under review: Lilly, C. and Webb, B. (1983). 'No-Fault: A Review of Its Cost'. Journal of Insurance Regulation', December 1983, Vol. 2, No. 2, pp. 176-203.

Overview

This paper contains claims data for automobile insurance that were collected by the Insurance Services Office and the National Association of Independent Insurers. The data is for all U.S. states for the period 1975 to 1982, and is reported for tort states, add-on states, verbal threshold states and medical (or monetary) threshold states. A description of these terms is included on page 22 of this review. The costs under review are personal injury insurance costs, bodily insurance costs, and bodily injury plus personal injury insurance costs for the different insurance regimes described above.

Results

The general conclusion from this paper is that the introduction of no-fault insurance did not lead to any significant reduction in insurance premiums. The increases in premiums over the period from 1975 to 1982 in 'tort' states are broadly in comparison with the premium increases in the states that adopted no-fault with 'add-on' insurance. Moreover, the premium increases over the same time period for 'tort' states are shown to be significantly less than the increases in the premiums in no-fault states who included a medical threshold. Tables 1 to 3 set out the major findings of this paper.

Table 1: Increases in Pure Premiums for Bodily Injury Insurance for the Period 1975 to 1982.

Tort States	60.47%
No-Fault with Add-on States	56.26%
No-Fault with Verbal Threshold	46.44%
No-Fault with Monetary or Medical Threshold	95.35%

Table 2: Increases in Pure Premiums for Personal Injury Insurance for the Period 1975 to 1982.

No-Fault with Add-on States	79.74%
No-Fault with Verbal Threshold	82.98%
No-Fault with Monetary or Medical Threshold	235.08%

Table 3: Increases in Pure Premiums for Bodily Injury plus Personal Injury Insurance for the Period 1975 to 1982.

No-Fault with Add-on States	56.5%
No-Fault with Verbal Threshold	58.92%
No-Fault with Monetary or Medical Threshold	149.94%

Commentary

The authors note that the results reported in Table 1 for the verbal threshold group of states should be treated with caution. The reason being that the three verbal threshold states (Florida, New York and Michigan) all experienced a number of changes to their insurance system after the introduction of no-fault. For example, Florida mandated a 15% reduction in premiums when the law went into effect and a rate freeze was instituted for 1972. Also, increases in the tort threshold were introduced in 1976, 1978 and 1982. Finally, the medical expense coverage and the lost wages benefit were significantly reduced in 1977 from 100% to 80% and from 85% to 60% respectively.

The state of New York changed from a medical threshold to a verbal threshold in 1977, and in the same year limits were imposed on fees charged by suppliers of medical care. Michigan incorporated unlimited medical benefits in its no-fault regime.

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