THE DEREGULATION OF SAFETY : A CRITICAL REVIEW

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ABSTRACT: *Policies of economic and social deregulation have developed considerable momentum in New Zealand. It is appropriate to reconsider the relative advantage of regulatory and deregulatory approaches to safety management. Any such analysis must also consider two closely related topics; the nature of the legal system through which victims recover compensation and the theory of offsetting behaviour which claims that all safety regulations are doomed to failure*

It is argued here that the objective of government in the road safety arena is the minimising of net social cost. A case is put for the view that market mechanisms will fail to achieve this result. Because of external effects even ideal road safety consumers will select too little safety. Therefore, special measures are necessary. In theory both the tort liability legal system and regulation can provide incentives to greater safety. Experience shows that tort liability fails on both efficiency and equity grounds. Overall, a strong case for regulation emerges which is not disturbed by an ethical analysis suggests that government may be morally required to intervene if regulation would save lives.

One of the more consistent political trends of the last decade has been the widespread adoption throughout the world of the political agenda of the new right. There has been wide acceptance of the view that the economic and social regulations of the past largely have failed to bring about the benefits expected of them. Instead, governments have opted for policies involving less taxation, less public ownership, less central planning and fewer regulations. Put more simply, they have sought less government and more personal responsibility for matters such as safety.

The drive to deregulate stems from the increasingly held belief that there are better ways than regulation to achieve society's objectives. This philosophy can be, and is, applied to road safety. During the last decade road safety regulations such as periodic motor vehicle safety inspections and mandatory use of motorcycle helmets have been abandoned in several parts of the world (Chenier and Evans, 1987; Garbacz and Kelley, 1987). Seat belt regulations have never been introduced in some places (Garbacz, 1987b). As one opponent of regulations points out, it is rather too simple to think that if road accidents are a problem you can simply pass a law against them and they will all go away (Asch, 1986). In New Zealand, where the process of political modernization has considerable momentum, there is uncertainty about the implications of deregulation for the management of safety generally and road safety in particular. Should government retreat from the management of safety, as it has from other social arenas, or are there particular features of risk that make regulation more than usually appropriate?

This paper will set out for examination the full range of issues to do with the regulation of safety. The accident context will be that of road safety, but the results will be examined for wider application. I will suggest below that the objective of government in the safety arena must be one of economic efficiency - ie, ensuring that net social cost is minimised. By net social cost I mean the social cost of accidents plus the cost of safety measures. The central question then becomes one of deciding whether market mechanisms will always minimise the net social cost of accidents or whether there are circumstances that require intervention. The range of issues involved in answering this question is broad, involving principles from economic theory, law, ethics and accident analysis. Limitations on space mean that some aspects of the issue are introduced in a limited way and given less space than they might otherwise receive.

THE CASE FOR THE DEREGULATION OF SAFETY

The arguments against social regulation as a way of managing risk are of two kinds. The first involves arguments of a general nature stemming from the belief that all social regulation is counter-productive, regardless of its purpose. The remainder are more specific and hold that there are special features of situations

involving risk of injury or death that make regulation more than usually inappropriate

The more general arguments for the deregulation of safety are primarily economic in nature and have to do with the superiority of the free market as an optimising system However, any consideration of market mechanisms in the context of safety must also include an examination of the nature of the legal system through which the victims of unsafe actions seek compensation The alternatives are the tort system of negligence law and the various forms of no-fault accident insurance or compensation schemes, and perhaps some hybrid of these two. The nature of the legal framework for compensation may affect significantly the operation of market mechanisms in the safety arena.

Tort law is designed to supplement and re-enforce the general incentives of the market system in regard to accidents and safety (Swan, 1984) This is achieved by permitting the injured party to sue the injurer for compensation No-fault schemes regard road accidents as a community problem rather than an individual responsibility (New South Wales Law Commission, 1983). They limit or remove entirely the right to sue for damages in exchange for the right to receive prompt, adequate compensation for loss without regard to fault.

The more specific argument for the failure of safety regulations has to do with an hypothetical phenomenon known as offsetting behaviour The terms 'offsetting behaviour' and 'risk homeostasis' refer to human behaviour which, it is suggested, causes people to respond to a new safety measure by undertaking more risky behaviour The net effect may be that little or no safety improvement is achieved, or even that the risk burden is shifted onto another party. This is a serious charge which has among its implications the possibility that safety regulations may be inherently unsafe

Altogether, there are at least seven arguments for the deregulation of road safety:

1 Regulation is paternalistic and discriminates against the poor. Why should a bureaucrat decide how much safety individuals must purchase? Safety regulations discriminate against low income earners because they are forced to meet the safety standards required by the community as a whole. They may wish to purchase less safety, exercise greater care and use their resources in more rewarding ways (Poole, 1982; Asch, 1986).

2 Regulation results in the growth of administering bureaucracy, which is a thoroughly bad thing. According to Robert Poole the classic bureaucracy is "...unable to keep up with technological change, wasting resources, stumbling along

from crisis to crisis, pressured by lobbyists, harassed by politicians and seeking protection in the bowels of the civil service system." (Poole, 1982)

3. The true benefit of safety regulations is rarely known. The expected safety benefit of any regulation is usually unstated before introduction and unexamined after. Therefore the reality of any social benefit usually remains forever unknown. Where evaluation does take place the people who evaluate are the same people who introduced so naturally the regulation is judged a resounding success (Poole, 1982; Asch, 1986)

4 Market mechanisms would produce a superior tradeoff between safety and its cost. Risk is an externality. The socially optimal amount of risk is obtained when the marginal cost of further risk reduction rises to meet the marginal benefit ie, when the cost of accidents plus the cost of their control is minimised. Regulators tend to seek zero risk, which is not an economically rational target. Regulations reduce choice, distort the market and obscure that optimal tradeoff (Garbacz, 1987a)

5. The no-fault, compulsory insurance schemes that go hand in glove with safety regulations reduce further the choice available to safety consumers, distort further the market for safety, remove much of the personal incentive for safe behaviour and thereby increase accident rates. Because risk is an externality it should be fully internalised by those who produce it, which requires tort liability (Swan, 1984).

6. Accident compensation schemes, which in effect pay people to have accidents, will lead to increases in accident numbers, claim frequencies and disability durations. Massive cost blowouts can be expected (Garbacz, 1987a).

7. In many situations safety regulations do not reduce accident rates anyway, because consumers will offset improved safety by more risky behaviour. Thus drivers made to wear seatbelts will feel safer and therefore drive more riskily causing an increase in casualties among other road users (Peltzman, 1975; Wilde, 1982).

ARGUMENTS ONE AND TWO: POLITICS AND PREJUDICE

Not all of these arguments are of equal merit. The first two of them can be set aside at once. The suggestion in point one that regulation is 'paternalistic' is a statement of political philosophy. Preference is being expressed for a political system that gives greater recognition to personal freedom and less to collective responsibility. As a political argument it will be supported by some and denied by others but it remains essentially a matter of personal belief. The suggestion that safety regulations

discriminate against low income earners is false Low income earners have the most to gain from no-fault insurance and accident compensation schemes because they lack the resources to cope with the consequences of a serious accident under tort liability circumstances - vehicle repair costs, medical cost, time off work, legal action to recover damages or to defend against damages, and much delay

The second argument above suggests that bureaucracies never get anything right and cost the earth. While it is founded on element of truth (bureaucracies can lack incentives for good management performance) this argument is largely prejudice. I propose not to examine it further.

The remaining arguments deserve closer attention. Arguments three, four, five and six are all different facets of a philosophy suggesting that society's welfare will be maximised by a safety management system in which freedom from risk is seen as a consumer good. Points three and four suggest that the optimising of its supply should be left to market mechanisms. Points five and six suggest that the compensation of injured parties should be left to tort liability Point number seven introduces the problem of offsetting behaviour.

ARGUMENTS THREE AND FOUR: SAFETY AS A CONSUMER GOOD

Road safety is a good in the sense that it enhances our welfare. Just as they do with other goods, different members of the community prefer different kinds and amounts. Left to their own devices some consumers will purchase large amounts while others will prefer to reduce their spending on safety in order to achieve other priorities The availability of choice ensures that individual consumers are able to maximise their utility As individual consumers maximise their utility society minimises the combined cost of accidents plus safety measures.

In traditional economic theory the grounds for government intervention in any market fall into one of two categories. First, there may be problems with the operation of a free market and second the market may reach an efficient solution but it is one that involves injustices in the sense that there are winners who do not deserve to win or losers who do not deserve to lose Government may then intervene in the name of equity

Argument three: Maximising efficiency.

From an economic efficiency standpoint both road accidents and road safety measures cost society the opportunity to do other and more useful things with the resources available Therefore, government's goal for the management of road safety must be to ensure that the combined cost of accidents plus associated safety

measures is minimised (Poole, 1982) Boyer and Dionne (1987) suggest that:

> This is essentially the Pareto criterion which will be retained here since this efficiency criterion, despite its obvious drawbacks, is the most widely used criterion in economic theory today It represents a minimal criterion in that the majority of agents can agree with it

Thus it is not economically rational to seek absolute safety For greater safety to benefit society the value of reduced risk to safety consumers must exceed the social cost of the resources used to obtain it Either too little safety or too much safety is sub-optimal In theory a free market for road safety, involving adequate choice of safety measures and well-informed safety consumers, should come to equilibrium at the point of minimum social cost If it did not do so and if government elected to intervene with the purpose of improving efficiency then there should be clear evidence that the benefit of the regulation exceeded the cost In my experience this principle is rarely applied by safety managers

Argument four: A free market will do it better

For market mechanisms alone to produce an optimal expenditure on safety the usual sources of market failure must be absent, or at least predominantly absent In the context of road safety, the requirement that market failures be absent becomes the following three key conditions (Oi, 1973; Boyer and Dionne, 1987):

1. Consumers must behave as if they were well informed about risk levels, accident consequences and cost/risk tradeoffs

2 Consumers must behave as if they were able to judge correctly the risk consequence of their options

3. Those who make the safety decisions must bear all the costs and reap all the benefits In other words, externalities must be absent or fully internalised

Imperfections are evident in almost all markets The important question is one of degree Compared with other markets road safety is characterised by widespread failure to meet the conditions above (Boyer and Dionne,1987; Warner, 1987) both on the grounds of consumer ignorance and externalities The implication of significant sources of market failure is that special measures may be necessary in order to increase efficiency

There is clear evidence that people misjudge issues to do with road risk For example, where the use of seatbelts remains optional wearing rates are low, typically between ten and thirty percent Economists who have evaluated the benefits and costs of

restraint use have been struck by the apparently irrational behaviour of those who do not wear available belts (Winstone and Mannering, 1984). There is evidence of an 'insensitive to low probabilities' phenomenon which distorts judgments about road risk (Arnould and Grabowski, 1981; Warner, 1987). Road safety consumers appear to have misjudged risk matters when they drive vehicles with defects in such key safety components as tires and brakes. Drivers appear to refuse to accept reality when they carry unrestrained children in the front seat. Motorcyclists do so when they travel with bare feet, dressed in shorts and t-shirt or without a helmet. Road users obstinately make what are unquestionably wrong choices when they drive while intoxicated or drive with excessive speed.

In addition to the poor judgments about risk implications there is evidence that even careful and risk averse consumers lack the information needed to exercise propper choice. Joskow (1973) suggests that "Undoubtedly there is no other product for which consumer ignorance is so prevalent." If you believe that properly informed road safety consumers do exist, try the following very elementary test. Answers are given upside down at the bottom of the next page:

ROAD SAFETY CONSUMER ADEQUACY TEST

Question one. Which of these two child safety devices should be purchased first - a bicycle helmet for the eight year old or a car safety seat for the two year old?

Question two. Which of these community safety projects should be completed first on any existing four lane highway - maximise delineation (post mounted reflectors plus reflectorised lane markers) or install crash barriers (steel w-beam on wooden posts)?

Question three. Which of these two vehicle safety measures should you spend your next spare $20 on - a centre-mounted rear brake light or a thorough inspection by a qualified safety mechanic?

Question four. Which group of teenage drivers has the highest road casualty rate - those who have completed a practical driver education programme or those who have not?

My point here is that the amount that needs to be known to be a competent, utility maximising safety consumer is considerable, complex and in a state of constant evolutionary change. Efforts to educate safety consumers by supplying necessary information do not

have a record of success (Warner, 1987) In an unregulated market wrong choices are often made.

However, the most significant sources of market failure in road safety result from widespread externalities that cannot be internalised (Warner, 1987). Safe behaviour by one road user creates benefits for all others. Unsafe behaviour creates additional risk However, society for the most part is unable to recognise, let alone reward, the safe drivers for their services or recover from the unsafe their costs. Boyer and Dionne (1987) have shown by formal utility analysis that even fully informed, ideal road safety consumers will purchase the wrong quantity of safety. Boyer and Dionne report that:

> ...the level of self-protection activities chosen by a given individual is lower than the efficient level because the individual neglects to take into account the positive external effects of his activities on other drivers' well being. In order to reach an optimal level under [this] constraint, one must create mechanisms which would motivate individuals to take into account these external effects

Only if the externalities are fully internalised will a rational individual choose the socially optimal amount of safety.

Not only is the road environment characterised by numerous positive externalities, but they are of a form that is particularly resistent to known ways of discouraging externalities. The economic literature suggests that there are four primary mechanisms for dealing with externalities (Oi, 1973). These are:

- internalisation by fusing the two parties;
- taxes and subsidies;
- establishing through property rights a market for externalities; and,
- regulation

ANSWERS

QUESTIONS 1, 2 AND 3

My answers assume that you would favour in each case the most efficient option. For questions 1-3 the first option in each case has a significantly greater benefit-cost ratio.

QUESTION 4

You may have spotted the trap: Well trained teenage divers get permission to do much more diving. Therefore their exposure is greater and they have more accidents.

There is no obvious way to induce an efficient level of care among drivers by means of internalisation, taxes or subsidies or the creation of markets in property rights. The fusing together of the externality generator and recipient is a solution that only applies to companies Solutions based on the exchange of property rights are not feasible because of the difficulty in defining adequately ownership rights on public roads Transaction costs would also be very high Taxes and subsidies are ruled out by the problems associated with observing the behaviour to be taxed or subsidised. Boyer and Dionne (1987) conclude that " It would seem that traditional measures to reduce internal effects .. cannot generally be applied to road safety. Hence other types of solutions must be considered . " Warner (1987) concluded that " no [market] imperfection by itself presents an overwhelming case for governmental involvement, but the sheer number of deviations from the characteristics of an ideally functioning market presents a case that must be considered. "

Overall, the combination of inadequate information, poor judgement of risk and widespread external effects creates a case on efficiency grounds for government intervention in road safety matters There may also be justification for intervention on the grounds of justice or fairness

Equity issues

Efficiency matters aside, it is possible that Government may sometimes have a case for intervention on equity grounds. There are at least two circumstances when matters of justice or fairness arise in the road safety arena. The first has to do with the safety of children and the second involves the morality of not regulating for the use of measures that are known to save lives

Equity arguments can justify regulations for the safe carriage of children in cars Because children cannot make their own safety decisions and purchases government may decide that it would be unfair to children to permit parents to value the safety of their children below levels that were considered normal for that society. This is no more than an extension of the role that government takes in other situations where the wellbeing of children can be compromised Therefore, regulations requiring either child restraints or mandatory carriage in the rear seat can be justified on equity grounds, regardless of their efficiency from a benefit-cost standpoint, providing it is certain that they do produce safety benefits

The second situation that can involve questions of equity has to do with the morally correct position to adopt in relation to safety measures such as seatbelts and motorcycle helmets that affect only the safety of the user. Offsetting behaviour aside, measures such as these have no external effects Because of the absence of externalities the case for deregulation is implicitly stronger here. It can be argued that society has no grounds to

intervene in individual decisions about whether or not to use such equipment.

A decision not to regulate for restraint use or helmet use implicitly involves the decision by government that a higher road casualty rate is morally acceptable because the people concerned chose to expose themselves to increased risk. This moral stance is unusual in comparison with society's high regard for the preservation of life in other spheres of endeavour. Society does not permit suicide or euthanasia. Therefore, neither a desire to die nor an indifference to death are recognised by society as morally acceptable choices. Extravagant (reactive) efforts are made to rescue those in peril on the sea, in the bush or in the mountains. Clearly, society accepts a moral responsibility to mitigate the consequences of misjudged risk in circumstances outside road travel. What is the moral distinction between the proactive rescue of imperiled motorcyclists by means of mandatory helmet laws and the reactive rescue of those in peril elsewhere? I confess that I am unable to suggest one. Unless there is a clear distinction defensible on ethical grounds then the deregulation of safety may be found to be ethically insupportable-- in the same way that standing by while a person died for want of assistance would be judged unethical.

ARGUMENTS FIVE AND SIX: TORT LIABILITY VERSUS NO-FAULT COMPENSATION

The combined legal and insurance structures established to support road safety objectives should contribute to both efficiency and equity goals. In efficiency terms society's principal objective is to minimise net social cost, a goal that is likely to be compromised by widespread external effects. If economic efficiency is to be maximised measure must be taken to increase the amount of safety chosen by individuals. In equity terms government will wish to ensure that society's structures provide the victims of poor safety decisions with prompt and appropriate compensation for their loss.

One obvious way to contribute to both efficiency and equity goals simultaneously is to make safety violators economically responsible for all losses, their own and those of the victims. Road users will then take those potential costs into account in their safety decisions, thus internalising their external effects. At the same time a system is provided through which victims may recover losses. This is the logic of tort liability. Those who argue for unregulated safety markets, therefore, often also argue for tort liability in order to ensure that at least one significant source of market failure is removed (Law Commission, 1987).

Until recently a tort liability system of some kind was the mechanism for compensating the victims of accidents in most countries. However, tort liability in its practical application has a

number of deficiencies that have resulted in it being abandoned or significantly modified. The first and most obvious fault comes about when individuals share their liability for damage by insurance against claims. Unless the insurance company is able to recognise and load heavily the policies of those who show greater likelihood of being sued for compensation, or unless government intervenes to place limitations on rights to insurance, the result will be that the externalities once again escape internalisation (Boyer and Dionne, 1987). Thus tort liability has not always delivered the efficiency gains that were expected of it

Equally, tort liability in many states has been judged a failure on equity grounds also. Under tort liability many accident victims were inadequately compensated because they could not prove liability, because the safety violator had neither assets nor insurance with which to pay compensation, or because the transaction costs were too great. According to Keeton and O'Connell (1965) tort liability " provides too little, too late, unfairly allocated, at wasteful cost, and through means that promote dishonesty and disrespect for law " There is widespread support for the abandoning of tort liability in favour of some kind of no-fault system (Landes, 1982; Outreville, 1984; Witt and Urrutia, 1983). Between 1971 and 1976 sixteen states in the United States adopted no-fault schemes. New Zealand and Victoria followed in 1974. Tasmania followed in 1976

There is also a widespread view, not well supported by empirical evidence, that no-fault compensation schemes reduce incentives for safe behaviour and thereby reduce the efficiency of the safety-cost tradeoff (Landes, 1982). The New Zealand Law Commission (1987) acknowledges the rapid and continuing growth in accident compensation claims received by the Accident Compensation Corporation. It suggests, however, that much of the growth is due to the steady addition to the number of people requiring long-term support, which it regards as evidence of the Commission doing its job. In other cases it is suggested that growth stems from increasing reporting rates rather than increasing accident rates.

From the point of view of this study the implication of the widespread abandoning of tort liability is that there is now no obvious market mechanism solution to the problem of external costs in road safety management. Furthermore, the use of no-fault insurance and accident compensation schemes introduce further significant distortions of the market for safety which in the absence of tort liability may under-invest in safety to a significant degree. The net effect is to strengthen the case for regulatory control of road safety.

ARGUMENT SEVEN: OFFSETTING BEHAVIOUR

The final argument in favour of non-intervention in the road safety market suggests that, quite apart from any merits regulation may have on the grounds of efficiency or equity, it is doomed to failure because of offsetting consumer behaviour. The argument goes like this: An improvement in the perceived level of risk will cause people to relax their guard against accidents so that the number of accidents either doesn't change, goes up, or even becomes displaced onto some other group of people. Trapeze artists, for example, perform more risky aerial manoeuvres when there is a safety net below. Perhaps motorists required to wear seatbelts also perform more risky manoeuvres and thereby increase casualties among cyclists and pedestrians. According to Asch (1986) this is "...hardly an absurd possibility" He argues that:

> The expenditure on auto safety may be worthwhile. It surely will appear so if one is determinedly optimistic about regulatory benefits; but since the benefit magnitudes are uncertain, the net effect of our auto safety laws are, at the least, a subject of legitimate debate.

Offsetting behaviour is potentially a significant issue that should be resolved before any confidence can be placed in regulatory solutions to safety problems.

The theory that the introduction of safety measures changes people's behaviour has arisen, apparently independently, on two occasions in the academic literature. It was first suggested in the economics literature by Lave and Weber (1970), where it was labelled as offsetting consumer behaviour' Twelve years later it resurfaced in the risk analysis literature this time under the name of `risk homeostasis' (Wilde, 1982) The idea of offsetting behaviour has developed something of a following in economic circles, although it remains highly controversial. Significantly, however, in the more empirical accident analysis field, risk homeostasis has few friends.

Evidence for and against the view that safety improvements cause more risky behaviour comes from at least three sources The first involves case studies of the effect of safety regulations on accident events, such as the introduction of child proof medicine bottle caps The second source of evidence includes the results of modelling studies that use multiple regression or time series analysis to examine the effect on road casualty rates brought about by the introduction of major new road safety regulations The two favorite topics for modelers are the American road safety act of 1966 and the introduction of mandatory seatbelt use, for example the British restraint legislation of 1983 The third source of evidence involves empirical data dealing with the effect of the introduction of major safety regulations on driving behaviour

hospital casualty admissions and accident rates for different classes of road users

The effect of the introduction of child-proof ' medicine bottle caps in the United States is one of the cause celebres of the deregulators (Poole, 1982). This is what happened: The introduction of child-proof aspirin bottle caps in 1972 was followed by a decline in fatal and non-fatal accidental aspirin poisonings of children to around one third of their previous rates Apparently a great victory for safety regulation. However, when the accident figures were related to the sale of aspirin, which also declined considerably in the years after 1972, the change in accidental poisonings was found to be no longer statistically significant (Viscusi, 1984) Furthermore, when the contribution made by child-proof bottles to the poisoning events was examined it was found to increase from 40 percent of incidents in 1972 to nearly 75 percent by 1978. Viscousi (1984) argues that "..consumers have been lulled into a less safety conscious mode of behaviour by the existence of safety caps." A victory for regulation becomes a great victory for offsetting behaviour

Given that offsetting behaviour clearly exists, what evidence is there for the same effect in road safety? The most heated debate over offsetting behaviour followed the publication in 1975 of a regression model of American road fatalities (Peltzman, 1975) The specification of the regression model proposed by Peltzman is still regarded by some as the state of the art in mathematical explanations for observed road fatalities (Garbacz and Kelley, 1987). Peltzman's model suggested that the parcel of vehicle safety measures introduced in the American Safety Act of 1966 had no overall effect on national fatality rates. A reduction in occupant fatalities by 10,000 between 1966 and 1972 was matched by an increase in fatal injuries to pedestrians and cyclists of almost the same magnitude. According to Peltzman, safety benefits for occupants were purchased at the expense of increased risk elsewhere, apparently the result of drivers offsetting their improved safety by less cautious driving

Peltzman's results were followed by a number of attempted replications, both supporting and contradicting his findings. Supportive findings were reported by Nelson (1976), Crandall and Graham (1984), and Crandal et al (1986) The latter two studies both found the offsetting effect to cause a considerably smaller number of casualties than those reported by Peltzman. Both studies concluded that overall, the 1966 regulations saved many more lives than they cost Peltzman's results were contradicted by Joksch (1976), Robertson (1977), Lindgren and Stuart (1980), Graham and Garbner (1984) and Lund and Zador (1984).

The study reported by Graham and Garbner (1984) deserves closer attention These authors reported that improvements to Peltzman's regression methodology and plausible changes to the

specification of explanatory variables reduced offsetting behaviour almost to zero. They found that the safety regulations introduced the USA in 1966 saved 10,000 vehicle occupant lives each year by 1980 without any effect on pedestrian safety There was a small, marginally significant increase in motorcycle fatalities The authors reported that a variable representing the introduction of no-fault accident compensation laws had no explanatory power within the model Accident compensation did not appear to increase accident rates

Closer to home, Conybeare (1980) reported an offsetting effect following the introduction of mandatory seat belt legislation in Australia. Garbacz (1987b) found no such effect in New Zealand road casualty data.

Evidence that the introduction of safety regulations does not change drivers' behaviour in accident-prone situations was published by O'Neil and his co-workers (O'Neil et al, 1984) These authors reasoned that if the introduction of major safety initiatives made drivers take more risks then changes in their driving behaviour ought to be observable They therefore sought empirical evidence of a change in driving behaviour before and after the introduction of mandatory seat belt laws in both Canada and Britain The authors recorded driver behaviour at a significant number of situations, including negotiating sharp bends, intersection behaviour with and without traffic lights, following distances and speed, all at a wide range of sites. Their experiments were conspicuously well designed.

O'Neil and his co-workers summarised their results as follows:

> The studies in both Canada and England are the most carefully controlled assessments of risk compensation to date. Neither study found evidence that driver behaviour becomes riskier when drivers are required to use seat belts. In fact there was relatively little change in the average behaviour of drivers following the laws. Certainly, the pattern of findings does not support the hypothesis of risk compensation either in the near term, when drivers were probably most conscious of the law change that had taken place, or in the long term, when there was more time in which they could have considered the impact of the change on their risk of injury.

There is also empirical evidence to do with the effect of major safety regulations on hospital admission rates Rutherford and his co-workers examined the change in the numbers of road casualties admitted to hospital brought about as a result of the 1983 UK seat belt legislation They reported that " admissions of front seat occupants were reduced by 30%, brain injuries were down by 39%, facial wounds by 53%, and injuries to the lungs by

40% " There was no significant class of injury that increased as a result of the introduction of seat belt legislation Clearly, among the benefits of successful regulation should be counted the reduction in demand for increasingly costly, community provided medical services

To sum up, there is now little support to be found for the notion of offsetting behaviour in road safety The original regression model of Peltzman (1975) has been heavily eroded by subsequent regression studies Rather than supporting offsetting behaviour the more recent regression models indicate substantial reductions in road casualties following the introduction of major safety regulations Hospital admission data shows marked reductions in road casualties following the introduction of major safety regulations There is no empirical evidence for risk homeostasis There is good evidence, on the other hand, that there are no observable changes in safety sensitive driving practices following the introduction of major safety regulations. There is also empirical evidence indicating that it is unbelted drivers that are more involved in causing casualties not belted drivers There remains not a single unchallenged source of support for offsetting behaviour in the context of road safety

CONCLUSION

I have suggested that society's most defensible objective in the management of any risk source is the minimising of net social cost Given acceptance of this efficiency criterion, the task becomes one of identifying the management strategy that is most likely, all things considered, to approach that goal.

In selecting a safety management strategy the alternatives are a free market supported by tort liability and regulation supported by cost benefit analysis In the road safety arena a number of factors make it most unlikely that market driven solutions will achieve the Pareto optimum Those factors include difficulties with inadequate information, poor risk judgments and iniquities in the operation of pure tort liability schemes Even if it were possible to overcome these significant market imperfections, safe and unsafe driving practices create externalities that affect the risk faced by other road users Because of those external effects road safety consumers can be expected to choose less safety than the Pareto optimal solution requires Hence safety interventions are justified providing it is known that they increase efficiency. Given that market mechanisms are unlikely to produce the socially optimal amount of safety, tort liability is not required for safety reasons and can be abandoned in favour of no-fault compensation where social benefits are seen in doing so.

Further, the evidence introduced here suggests that offsetting behaviour cannot be used as grounds for the deregulation of road safety The phenomenon of increased risk following safety

regulation clearly exists. However, an analysis of the literature for and against offsetting behaviour in the context of road safety suggests that there is no case to answer on the balance of evidence currently available. There is good empirical evidence that the introduction of major road safety regulations reduces casualty rates. There is also evidence that the abandoning of safety regulations increases casualties

In most circumstances, therefore, the criterion required for the introduction or retention of a safety regulation will be the availability of a supporting benefit-cost analysis. This requirement will only be set aside in situations where accepted ethical principles are compromised. I am satisfied that government can require on moral grounds high safety standards for the carriage of children. I am concerned also that there may be a general moral requirement for government to regulate wherever there are efficiency-improving opportunities, and irrespective of any political philosophy that may be held about the acceptability of regulation. Not only is road safety regulation justified, assuming for the moment acceptable benefit-cost ratios, but it may be a moral obligation.

Finally, I wish to consider briefly whether this result is a general one, applicable to many situations involving risk to life and safety, or whether it is in some way unique to road safety. Should government, for example, regulate for and certify the safety of commercial aircraft, small private pleasure boats, or lifts? What are the criteria on which such matters should be decided?

The first and most obvious criterion that might be applied is the magnitude of the social losses involved. Road accidents in New Zealand cost society more than one billion dollars annually, or around one thousand dollars for every household. The magnitude of this social cost is so great that government faces an obligation to implement efficiencies where opportunities exist for doing so. In comparison, the annual social cost of commercial aircraft accidents is at least two orders of magnitude lower. The annual cost of pleasure boating accidents is a further order of magnitude lower still and the cost of lift accidents is exactly zero.

It is difficult to advance a strong case for government regulation in the face of these (relatively) limited losses. Because the marginal cost of additional safety is almost certainly lowest in the arena of road safety, any additional resources available for expenditure on safety ought to be allocated to the safety project that returns the greatest amount of safety per dollar spent. That project will almost always be in the arena of road safety

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