The Relationship between Liability Regimes and Economic Development
A Study of Motor Vehicle Accidents in India

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INTRODUCTION

Liability rules deal with unintended accidents and related issues. A suit under liability rules is generally a private suit (over injuries) as opposed to a criminal prosecution. If the legal requirements are fulfilled, the injurer is required to compensate the victim. In this research project, I intend to study how the liability rules have evolved with the process of economic development. The scope and significance of liability rules has risen significantly over the entire 20th century. This also happens to be a period in which the world has witness phenomenal technological and economic progress. Before the coming of the railways and the industrial revolution the governing law for liability, that is, the tort law was rather an unimportant field. The emergence of modern liability rules can be attributed to the increase in the complexities of economic activities. With steam engines, modern traffic and risky products the number as well as severity of accidents rose dramatically. This gave

rise to the development of modern tort law, especially the 'fault' or 'negligence' doctrine.

By the middle of 19th century in both England and America, fault or negligence had become a normal standard of liability. Strict liability had become rather rare. The latter half of the 20th century has brought a further expansion of liability rules to include other areas like product liability, liability for medical malpractice, environmental liability, vicarious liability, etc.

An intuitive objective of liability rules is to compensate the victims for losses due to accidents. Under liability rules damage compensation can be claimed only if harm has been done. Harm is the first and foremost element of tort liability. Without harm there can be no suit under liability rules even against potentially dangerous acts. A second element is 'causation'—the injurer must be the cause-in-fact and a proximate cause of the harm, if he is to be held liable for the harm. The harm has to be connected by the means of a causal chain to an act of the injurer. Though causation is a very controversial topic, in practice, lawyers often use a simple criterion called the 'but-for' test to determine the causation.[1] Finally, to prevail in a suit, generally, a victim must also demonstrate that the injurer has breached a duty that he owed to the victim. When an injurer breaches a legal duty, he is said to be 'at fault' or 'negligent'. Breach of duty is caused by doing something which a 'reasonable' man would not do, or by not doing something which a reasonable man should do under the circumstances. To sum up, for an injurer to be held liable to compensate the victim not only the victim must have suffered the harm due to action or inaction of the injurer, but also the injurer should have acted negligently.

The cases of motor accidents constitute the major bulk of tort cases in India. In some very recently adjudicated cases, though, the

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[1] The question asked is, 'But for X, would Y have occurred?' If answer to this question is 'no' then X is a cause-in-fact of Y. An affirmative answer to the above question would mean that X is 'not' a cause-in-fact of Y.

scope of the law of torts has been expanded to include the cases of violation of personal liberty, fundamental rights, illegal detentions, and state liability for negligent behaviour of its officials. That is, there is a trend that indicates dramatic changes in liability law India. Tort law has expanded to assign liability to defendants for reasons other than negligence. Recent doctrines include joint and several liability, retroactive liability, and unlimited duration of liability. For example, insurers now worry whether courts will interpret contract language differently than what apparent message of relevant Acts.

A liability rule typically specifies whether and how much damage (liability) payments are to be made by the injurer(s) to the victim(s) of an accident. For example, the rule of negligence holds an injurer liable for the accident loss if and only if he was negligent, notwithstanding the level of care taken by the victim. The rule of negligence with the defense of contributory negligence holds an injurer liable if and only if he was negligent and the victim was not. In India, this rule requires proportional sharing of liability when both parties were negligent. That is, the compensation that the victim receives gets reduced in proportion to his or her negligence. The rule of strict liability always holds the injurer liable irrespective of the care taken by the two parties. Under the rule of strict liability with the defense of contributory negligence, the injurer can escape liability only by showing that the victim's negligence contributed to the harm, i.e, it is the injurer who is held liable except when the victim was negligent.

In this project, we will study the evolution of legal position with respect to liability rules as Indian economy has progressed. In India, road accidents constitute a major part of the tort cases. Therefore, we will study the evolution of liability rules for motor accident cases. There is another reason for focusing on motor accidents. Road transport has played a major role in economic development of India. Liability rules by increasing or decreasing liability of vehicle owners can encourage or discourage growth of surface transport and therefore the economic development. Therefore, it will be interesting

to know whether Indian liability rules have responded to the needs of economic development.

LIABILITY FOR MOTOR ACCIDENTS: INDIAN LAW

The Motor Vehicle Act, 1988, deals with motor vehicle accidents and related issues.[2] Originally enacted in the year 1939, during British rule in India, the Motor Vehicles Act has undergone a sea of changes between 1939 and 1994. The act has been amended comprehensively in the year 1988. The 1988 amendment makes the Act a welfare legislation. It also endeavours to strike a balance between conflicting interest of various sections of the society. Almost all the states in India have enacted Motor Vehicles Rules, to regulate the registration of vehicles, permits to the owners of the vehicles and driving license.

Before 1988 for motor vehicle accidents liability of injurers was predominantly a fault based liability. However, the 1988 amendment to the Act brought in an element of strictly liability. The following provision (Section 140) was introduced in the amendment:

> Where death or permanent disablement of any person has resulted from an accident arising out of the use of a motor vehicle or motor vehicles, the 1 owner of the vehicle shall, or, as the case may be, the owners of the vehicles shall, I jointly and severally, be liable to pay compensation in respect of such death or disablement in accordance with the provisions of this section.
>
> The amount of compensation which shall be payable under sub-section in respect of the death of any person shall be a fixed sum of [*fifty thousand rupees*] and the amount of compensation payable under that sub-section in respect of the permanent disablement of any person shall be a fixed sum of [*twenty-five thousand rupees*].

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[2] The act came into force on July 1, 1988. Section 165 of the MV Act provides for the constitution of Motor Accidents Claims Tribunals at the state level.

In simple terms, this amendment implied that the injurer or the insurance company of the injurer has to pay a certain amount as compensation to the victim irrespective of whose fault it is. The Act was further amended in 1994. As a result of this amendment, liability of injurer became even stricter. The following significant change was brought by inserting of Section 163 A. This change introduced special provisions as to payment of compensation on structured formula basis:

> Notwithstanding anything contained in this Act or in any other law for the time being in force or instrument having the force of law, the owner of the motor vehicle or the authorised insurer shall be liable to pay in the case of death or permanent disablement due to accident arising out of the use of motor vehicle, compensation, as indicated in the Second Schedule, to the legal heirs or the victim, as the case may be. Explanation: For the purposes of this sub-section, 'permanent disability' shall have the same meaning and extent as in the Workmen's Compensation Act, 1923 (8 of 1923).
>
> In any claim for compensation under sub-section (1), the claimant shall not be required to plead or establish that the death or permanent disablement in respect of which the claim has been made was due to any wrongful act or neglect or default of the owner of the vehicle or vehicles concerned or of any other person. The Central Government may, keeping in view the cost of living by notification in the Official Gazette, from time to time amend the Second Schedule.'

The Apex Court, after examining the scheme of the related provisions in the previous Act and the reasons for entertaining a claim for compensation under Section 163-A of the Act, has ruled that the determination of compensation under Section 163-A is final and not of interim measure and noticed the significant feature that the legislature has deliberately not provided it to be in addition to the compensation payable on the principles of fault liability as was the case with section 140 of the Act.

In addition to these legislative changes, Indian courts, in some landmark judgments have expanded the scope of liability. Various legal doctrines have been interpreted liberally as to increase the scope of liability, especially of insurance company of injurer. The criteria of cause-in-fact and foreseenability have been explained in many judgments.[3] The question 'what constitutes a negligent act?' has been answered at length in many interesting judgments by Indian courts.[4]

Moreover, Indian courts have increasing become more sensitive to the plight of victims of road accidents. Part of the approach can be attributed to the interpretation of law by courts. They have adopted innovative approach toward the liability of insurers as well. Again, the idea is to provide better compensation to the victims. Consider the following:

> A 10 year old girl met with a fatal accident in 1990 while traveling in a truck. Her father brother and sister made a joint claim under the Motor Vehicles Act, 1988. The Motor Accident Claims Tribunal awarded compensation of Rs. 25,000. This was challenged by both parties and the Division Bench of the High Court doubled the compensation.[5]

The issue was whether the insurer had a liability towards a gratuitous passenger such as the girl under the 1988 Act prior to its amendment in 1994? The apex court ruled that under the 1988 Act an insurance policy covering third party risk was not required to exclude gratuitous passengers in a vehicle, no matter that the vehicle is of any type or class.

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[3] The doctrine of foreseenability says that consequences which cannot be reasonably foreseen, and are too remote give rise to no liability. For instance see, *Rajasthan State Electricity Board* v. *Jai Singh*, AIR 1997 Raj 141; *Rural Transport Service* v. *Bezlum Bibi* AIR 1980 Cal 165

[4] See, *Babu Singh* v. *Champa Devi,* AIR 1974 All 90; *Chatra* v. *Imrat Lal* (1998) 1 Civil L J 670 at 671 (MP): 1998 ACJ 314 (MP), Also, see Bangia (1997, p 267)

[5] *New India Assurance Company* v. *Shri Satpal Singh and Ors* (AIR 2000 SC 235)

The 16 year old victim, returning in the truck from a marriage ceremony died as a result of the rash and negligent driving by the driver of the goods vehicle. The said vehicle was insured by the appellant insurance company. The mother of the victim preferred a claim petition for compensation before the Motor Accidents Claim Tribunal. The Tribunal relied upon the Satpal Singh case and accepted the claim petition, awarding compensation which was upheld by the High Court.[6]

Whether the amended Section 147 was intended to cover gratuitous passengers or only third party risks. The Court first discussed the cases prior to the amendment such as the *Asha Rani* case and the *Devireddy* case (discussed above). The Court examined the effect of the amendment to Section 147, coming to the conclusion that it was unambiguous. The Court held that prior to the amendment, the words 'any person' could be held not to include the owner of the goods or his, authorized representative traveling in the goods vehicle. Post the 1994 amendment, Parliament was held to have remedied that construction. However, the Court refused to extend this rationale to covering gratuitous passengers for whom no insurance policy was envisaged, and for whom no insurance premium was paid. They based this interpretation on the observation in the *Asha Rani* case that true purport of the words 'any person' was to be found in the liability of the insurer for third party risk, which was sought to be provided for by the enactment. The Court observed:

The liability of the owner of the vehicle to insure it compulsorily, thus, by reason of the aforementioned amendment included only the owner of the goods or his authorized representative carried in the vehicle besides the third parties. The intention of the Parliament, therefore, could not have been that the words 'any person' occurring

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[6] *National Insurance Co. Ltd*. v. *Baljit Kaur* (AIR 2004 SC 1340)

in Section 147 would cover all persons who were travelling in a goods carriage in any capacity whatsoever.

The Court, however, laid down an important proposition of law that in place of the insurer the owner of the vehicle shall be liable to satisfy the decree. The Court also held that such decision would be operative prospectively As regards the present case, the Court proceeded to ask the insurer to satisfy the claimant and recover the same from the owner of the vehicle.

Interpretation

The Motor Vehicle Act 1988 & its subsequent amendment in 1994 does not specify the liability of the insurance company towards gratuitous passengers. Hence how this issue is resolved depends upon how the Apex Courts interprets the issue. In one case the Apex Court holds the Insurer Company liable to pay compensation to the gratuitous passengers. But subsequently in cases cited above the Apex Court changed its position and held that ultimately it is the insured and not the insurer who is liable to pay compensation to the gratuitous passengers.

The courts have been pro victim. For instance, in *New India Assurance Co. Ltd., Shimla vs. Kamla & Ors.*, the Apex Court observed:

> The insurer and the insured are bound by the conditions enumerated in the policy and the insurer is not liable to the insured if there is violation of any policy condition. But the insurer who is made statutorily liable to pay compensation to third parties on account of the certificate of insurance issued shall be entitled to recover from the insured the amount paid to the third parties, if there was any breach of policy conditions on account of the vehicle being driven without a valid driving license.[7]

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[7] *New India Assurance Co. Ltd., Shimla* vs. *Kamla & Ors.* [(2001) 4 SCC 342; page 350]

Further,

In each case, on evidence led before the Tribunal, a decision has to be taken whether the fact of the driver possessing license for one type of vehicle but found driving another type of vehicle, was the main or contributory cause of accident. If on facts, it is found that the accident was caused solely because of some other unforeseen or intervening causes like mechanical failures and similar other causes having no nexus with the driver not possessing requisite type of license, the insurer will not be allowed to avoid its liability merely for technical breach of conditions concerning driving license.[8]

The court also ruled that:

We have construed and determined the scope of sub-clause (ii) of sub-section (2) of Section 149 of the Act. Minor breaches of license conditions, such as want of medical fitness certificate, requirement about age of the driver and the like not found to have been the direct cause of the accident, would be treated as minor breaches of inconsequential deviation in the matter of use of vehicles. Such minor and inconsequential deviations with regard to licensing conditions would not constitute sufficient ground to deny the benefit of coverage of insurance to the third parties.

Even where the insurer is able to prove breach on the part of the insured concerning the policy condition regarding holding of a valid license by the driver or his qualification to drive during the relevant period, the insurer would not be allowed to avoid its liability towards the insured unless the said breach or breaches on the condition of driving license is/are so fundamental as are found to have contributed to the cause of the accident. The Tribunals in interpreting the policy conditions would apply 'the rule of main purpose' and the concept of 'fundamental breach' to allow defenses available to the insurer under Section 149(2)

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[8] *National Insurance Co. Ltd*. v. *Swaran Singh* (2004) 3 SCC 297 (at page 337)

In another relevant issue, a vehicle is involved in an accident. The driver at the time of the accident is found to have fake license. The Issue is whether the Insurance Company liable to pay third party damages? The Judgment was:

> It was held that when owner hires a driver he will therefore have to check whether the driver has a driving license. If the driver produces a driving license which on the face of it looks genuine, the owner is not expected to find out whether the license has in fact been issued by a competent authority or not. The owner would then take the test of the driver. If he finds that the driver is competent to drive the vehicle, he will hire the driver. The insurance companies cannot expect owners to make enquiries with RTOs, which are spread all over the country to ensure themselves as to the validity of the driving license.[9]

Comments

The above cases clearly show that what is written in different section(s), is open to different interpretations by different Supreme Court Judges. Section 149 clearly states that if the driver of the vehicle is not found to carry a valid license (or has been disqualified to hold a valid license) at the time of the accident, then there is no Third Party Liability of the Insurance Company.

However, as we can see from the above cited judgment, the Supreme Court did not absolve the Insurance Company from its Third Party Liability even though the driver at the time of accident carried a fake license. According to the Supreme Court an Insurance Company can absolve from Third Party liability only when having a fake license is fundamental to the cause of the accident. Moreover, the Apex Court holds that it is not the responsibility of the insured

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[9] *United India Insurance Company (appellant)* v. *Lehru and others (respondents)* (2003) 3 SCC 338

to verify that his driver (hired employee) has a genuine license. Thus if at the time of accident the driver (who is not the owner of the offending vehicle) is found to have a fake license, it cannot be interpreted that the actual owner of the vehicle has committed a breach of contract with the insurer and hence the insurer is not liable to pay third party damages.

As of now it seems that the settled legal position is that third party compensation is a statutory liability of the Insurance Company. The Insurance Company cannot absolve from it unless there is a 'material' breach of contract (under conditions specified in Section 149) by the insurer.

In another case, an accident took place, on the night intervening 3 and 4 April 1986 and the death of Sat Narain in that accident is not in dispute. Primary dispute is only as to which party is liable to make payment of compensation and how much? As per admitted facts, Sat Narain the deceased was driving a truck bearing registration No. HRJ 4311 and was going from Hisar to Jind. His truck met with an accident with another truck bearing registration No. HRH 4301, which was being driven by Subash, respondent No. 4 in this appeal. The Tribunal, on appraisal of evidence, has come to a conclusion that respondent No. 4 was responsible for causing that accident, during trial his negligence was proved on record. Nothing has been said in that regard by counsel for the parties. Originally the offending vehicle (No. HRH 4301) was registered in the name of M/s Minaxi Gram Floor Mills, Hisar, of which Karan Pal Gupta, appellant in F.A.O. No. 269 of 1988 was the partner. At the time of accident, admittedly, he had purchased that truck from the Firm but no entry to that effect was made in the registration certificate. Objection was raised by the Insurance Company that as the offending vehicle was transferred not in terms of the provisions of the Motor Vehicles Act, no entry was made in the registration certificate and also no intimation was given to the Insurance Company, so it was not liable to pay the compensation amount. It was further contention of the Insurance Company that in view of the transfer of the vehicle, the

Insurance policy had lapsed and there was no subsisting contract between the Insurance Company and the transferee of the vehicle, Shri Karan Pal Gupta. That contention was negatived by the Tribunal. Same objection has been raised before this Court also. Counsel for respondents No. 1 to 3 and also claimants in Cross-objections refuted the argument s, raised by counsel for the Insurance Company.

The Hon'ble Supreme Court, while analyzing similar situation in the above said judgment, held as under: 'Thus, in our view, the situation in law which arises from the failure of the transferor to notify the insurer of the fact of transfer of ownership of the insured vehicle is no different, whether under Section 103-A of the 1939 Act or under Section 157 of the 1988 Act in so far as the liability towards a third party is concerned. [10]

Interpretation

Section 157 states that when the transfer or (under whom the insurance is purchased) transfers his vehicle to the transferee, then the policy of insurance of the vehicle is also transferred automatically. But the transferee needs to inform the insurer about this transfer in 14 days. In the above case, the transferee did not intimate the insurer about the transfer. Still the apex court did not absolve the insurance company of its third party liability. A similar judgment came in the *Rikhi Ram* v. *Sukhrania* case (2003(3) SCC 97) where the Apex Court ruled that the liability of the insurer does not cease even if the owner or the purchaser did not give any intimation of transfer of vehicle to the insurer.

Economics of Liability Rules

The law of torts has been one of the first fields of law to be analyzed from an economic point of view. A large body of work is related

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[10] *United India Insurance Company Limited* v. *Smt. Hargian Devi and others*

to the study of existing legal concepts such as negligence or fault liability, strict liability, causation and other doctrines under the law of torts.[11] The standard method is to analyze the efficient solution first and then check whether or not a particular liability rule gives incentives to reach it. In normative economic analysis of law of torts, it is taken for granted that liability rules should be so shaped as to promote efficiency. Although the efficiency approach has invited some criticism, the law and economics literature employs efficiency criterion of Kaldor-Hicks efficiency or wealth maximization for analysis, to the exclusion of any other normative value [see, for example, Cooter and Ulen 1998; Miceli 1997 Chapter 1; Posner 1992 Chapter 1].

As discussed above, under the law of torts, harm is the first requirement for liability. It is a measure for the magnitude of the damages that are to be paid by the injurers to the victims. Economic analysis deals with the important question of whether and how much damage payments are to be made by the injurer to the victim. The measure of the damages paid by the injurer can be considered in two respects; it influences the incentive for the injurer to take optimal care, and it determines who should bear the risk of an accident. For efficiency concerns, generally, it is argued that the damage compensation should be exactly equal to the harm [see Arlen 2000]. It has been shown that when liability payments are exactly equal to the harm, injurer will take efficient care. In economic analysis, inefficient behaviour is considered as the cause of harm, and hence a reason for invoking liability. By taking less than optimal care an injurer causes an increase in the expected loss and hence becomes a cause of it [Ben–Sahar 2000]. This, it is argued, provides a basis for liability of a negligent injurer. The negligence is defined in terms of any deviation from the optimal (efficient)

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[11] Noteworthy works are by Calabresi (1961), Shavell (1987), Landes and Posner (1987), Miceli (1997) and Cooter and Ulen (1998).

behaviour. As far as the economic importance of the principle of fault or negligence is concerned, in the literature on liability rules it has been extensively argued that in accident contexts where both the injurer and the victim can affect the risk of accident, the negligence based rules give both the parties efficient incentives. Thus, in the economic analysis of the law of torts, all the three elements of the law are analyzed with a motivation to provide an economic explanation for them.

Accidents such as those involving pedestrians and car drivers have costs associated with them. In economic analysis, these accident costs are defined to be the sum of the victims' losses resulting from accidents and the costs of precautions. It has been shown that the criterion of wealth maximisation imply that these accident costs should be minimised [Miceli 1997: Chapter 1]. The law of torts, it is argued, by allocating the risk suitably can give appropriate incentives to parties so that externalities are internalised. Calabresi (1970) and other above-mentioned analyses of liability rules have shown that different liability rules have different potential of reducing these costs. It has been shown that for a liability rule to be efficient in all accident contexts, a solely negligent party should be made to bear the entire loss [Jain and Singh 2002]. The economic analysis claims that a large majority of common law rules pertaining to torts can be explained as if these rules had been designed to promote economic efficiency [Landes and Posner 1987].

The main conclusion that has emerged from economic analyses of liability rules is the following: When both the parties can affect the chances of accident, as is the case with motor vehicle accidents, the rule of negligence, the rule of negligence with the defence of contributory negligence, and the rule of strict liability with the defence of contributory negligence are efficient. That is, these rules minimize the accident costs. The rules of no liability and strict liability, on the other hand, are not efficient [Shavell 1987; Landes and Posner 1987; Miceli 1997; Cooter and Ulen 1998; and Jain and Singh 2002].

However, economic analysis also clarifies that the above claim about the efficiency of liability rules is valid only if the due care levels are fixed at the efficient levels, and courts do not make errors while estimating the harm. It has been argued that for a liability rule to be efficient, among other things, it is important that under the rule negligent injurers are made to internalise the entire externality created by their acts. Therefore, it is argued that while fixing the damage awards (i e, the liability payments to be made by the injurer to the victim), courts should take into account the entire loss suffered by victim.

One crucial factor that could affect damage awards or the liability payments, and therefore the efficiency characteristics of liability rules, is an error made by a court in assessing the harm. A court may entitle the victim to over or under-compensation. Such court-errors can cause various effects depending upon the liability rule in force. For example, under the rule of strict liability if due to court-errors the liability payments are less than (more than) the actual harm, injurers will take less than (more than) the efficient care, i e, they will be under-deterred (over-deterred).

Coming back to the Motor Vehicle Act, 1988, (MV Act) it deals with motor vehicle accidents and the related issues. Section 140 of the MV Act, however, recognizes limited 'no fault liability' but only in the cases of death and permanent disablement.[12] More specifically, compensation for motor vehicle accidents is dealt with under Chapters X–XII of the MV Act. While deciding on the motor accident cases, Indian courts have applied the rule of negligence and the rule of negligence with the defence of contributory negligence.[13]

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[12] As mentioned above, this liability is limited to Rs 50,000 in the case of death and Rs 25,000 in the case of permanent disablement. Such compensation can be claimed without establishing any negligence on the part of the owner or the driver of the vehicle. A compensation claim exceeding the amounts can prevail only if negligence is proved.

[13] The issues of the contributory negligence and the defence of contributory negligence are explained and dealt with in *United India*, AIR 1982 Gujarat 151:

In the cases of *Kiranbala Dandpat* v. *Secy. Grid Corporation of Orissa Ltd*, *P S Bhatnagar, Bhajan Singh* v. *Joginder Kaur*, among others, principles of compensation have been elaborated.[14] As far as the legal position is concerned, in India compensation for the harm is supposed to be 'full'. That is, damages awarded should restore the victim to a position he would be in, if he had not suffered any harm at the hands of the injurer. But, as a matter of practice, there has been a large variance in the compensation awards, even in very similar accident cases.[15] Consider a few illustrative cases:

> In an accident case a boy of nine years was hit by a bus resulting in his death. The boy's parents were awarded a sum of Rs 18,000 by the tribunal, on account of loss of dependency. This award was upheld by the Andhra High Court.[16]
>
> In a similar case, a boy of nine years was run over by a bus resulting in his death. Karnataka High Court upheld a compensation of Rs 8,000 to the parents.[17]
>
> In another similar case, a nine year old girl was killed in an accident. Her parents were awarded a compensation of Rs 12,400.[18]

Note that these three cases are more or less contemporary.

1982 ACJ 368: 1982 TAC 410; *Yoginder Paul Chowdhury* v. *Durgadas* 1972 SCJ 483 (Del); Municipal Board Jaunpur vs Brahm Kishore AIR 1978 168 (All); Bhai Shamsher Singh, 1985 ACJ 360: 1985 (2) TAC 116 (P and H); *Vidya Devi* v. *MPSRTC* 1974 MPLJ 573: AIR 1975 MP 89; *Neera Tangri* v. *Pritam Dass Khurana* (1998) 1 Civil LJ 720 at 722, 723 (P and H); *K Divyananda* v. *N Shiva,* 1999 ACJ 37: AIR 1998 Kant 106 At 107; *Bimlesh* v. *HPRTC* 1999 ACJ 962 (SC), among many other cases.

[14] *Kiranbala Dandpat* v. *Secretary Grid Corporation of Orissa Ltd* 1998, AIR 159 (Ori); *P S Bhatnagar,* AIR 1978 P and H 166: 1977 ACJ 213*; Bhajan Singh* v. *Joginder Kaur,* 1991 ACJ 984 at 985: 1992(1) TAC 92 (P and H). Also see Gandhi (2002, p 98).

[15] The lack of uniformity in compensation awards has been noted in some legal writings as well. See for example Bhatnagar (2004).

[16] See *APSRT Corporation*, 1984 ACJ 451: 1984 (2) TAC 227 (AP).

[17] *Lakshmamma,* 1984 (2) ACJ 199: 1985 TAC 209 (Kar).

[18] *A S Manjunathaiah*, 1985 ACJ 295: 1985 (2) TAC 8 (Kar).

A boy of 12 years was killed in an accident. His father was awarded a compensation of Rs 25,000.[19]

In another case, a boy of 12 year was killed by a bus in an accident. Jammu and Kashmir High Court awarded a compensation of Rs 25,000 to his parents.[20]

In another similar case, a boy of 12 years was crushed to death in an accident involving a public carrier vehicle. His father was awarded a compensation of only Rs 4,000.[21]

Large variance in the award for similar cases is problematic. While it is true that the compensation can vary from case to case, it is difficult to justify that the amount of 'full' compensation can vary from Rs 4,000 to Rs 25,000 in very similar cases. The variation in awards is similar in other categories of cases as well. This large variance can be explained, among other things, by looking into the methods adopted by the courts while determining the compensation. Indian courts have adopted three different methods while determining the amount of compensation in the accident cases which result in death or permanent disablement. In the first method, called the method of annual dependency, a lump-sum amount is reached at by considering the annual loss of dependency. This amount is multiplied by the estimated span of life and from the amount thus arrived at, deductions are made on account of uncertainties regarding life and the income.[22] The second method is called the interest yield method. Under this method, annual loss of the dependency is calculated, and the fixed sum that will fetch the annual loss amount as interest is awarded as compensation.[23] The third method is called the multiplier system.

[19] *M A Rahim,* AIR 1973 Mad 83: 1972 ACJ 470.

[20] *Mohd Muzaffar,* 1980 ACJ 516 (J&K).

[21] *Nachhan*, 1985, ACJ 37: 1985 (1) TAC 214 (All).

[22] For illustrative applications of this method see *Mahadeb Roy* v. *Sikha Das,* 1999 ACJ 1042 (Cal), *N Sivammal* v. *M D Pandian Roadways Corporation,* (1984) 2 SCJ 109, etc.

[23] For applications of this method see, *Sushila Devi,* AIR 1974 MP 181, and *Commissioner, NCC Group*, AIR 1983 Ori 193: 1984 ACJ 459, among others.

This method is of a recent origin. Under this method calculation is based on the basis of annual loss of dependency multiplied by a suitable multiplier. The value of the multiplier in the relevant case depends on the age of the victim at the time of accident. The discrepancy among the above three methods has resulted in awarding of different damages even in very similar cases.

The multiplier method is said to be superior to the other two methods. This method and its superiority have been explained at length in a landmark judgment delivered by Justice Jagannadha Rao of A P High Court, in the case of *Bhagwandas* v. *Mohd Arif*.[24] While Indian courts are increasingly adopting this method, there are serious problems with the way it has been done. Under this method, assessment of the full compensation involves calculation of the annual loss of dependency, and the number of years for which the income has been lost due to accidents, i e, the multiplier. Due to the lack of information, a court is likely to make errors in assessing the 'full' compensation. But, with the help of the tables prepared by actuaries, the multiplier can be calculated with a fair degree of accuracy. The value of the multiplier depends on the age of the victim; lesser the age of the victim higher will be the multiplier and vice-versa. In fact, it is in this respect that the multiplier method has been shown to be the most objective and scientific method. Judgments of courts in the US and western Europe have demonstrated the same. Indian courts, in contrast, have used the same multiplier even for the victims of entirely different age groups. More surprisingly, a lower multiplier was used in the case of younger victims and a higher multiplier was used when the victims were older! Consider the following illustrative examples:

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[24] *Bhagwandas* v. *Mohd Arif,* AIR 1988 A P 99: 1987 ACJ 1052, *Bhanwarlal* v. *Hari Ram*, AIR 1994 MP 10 (14); *GMPR* v. *Santosh Chadha* AIR 1997 HP 36 at 40, *Sashikala Vats* v. *Janpad Panchayat, Morar* 2000, ACJ 459 (MP); *Sashikala* v. *Md Khairuddin,* AIR 2000, 52 (Ori), are some of the other illustrative cases in which the multiplier method has been used by courts.

In *Premlata Nilamchand Sharma* v. *Hirabhai Ranchhodbhai Patel*,[25] the deceased was 26 years old and court adopted a multiplier of 15 years.

In *Arunaben* v. *Mehmoodbhai Imamali Kaji* the deceased was 30 years old, and court adopted a multiplier of 15 years.[26]

In the case of *Pal Bus Service* v. *Surjit Kaur*[27] the deceased was aged 38 years and still a multiplier of 16 was adopted. M P High Court used a multipluier of 35 years in *MPSRT Corporation* v. *Sudhakar.* In this case the deceased was 23 years old.[28]

Surprisingly, even in the very same case, different courts have awarded different compensation, where an appeal was made against the initial awards. There are many such instances. Consider the following cases:

In *Oriental Fire and General Ins Co Ltd* v. *Keval Kumar* compensation calculated by the tribunal was Rs 55,000. The Punjab and Haryana High Court, on the other hand estimated it to be Rs 2,46,600.[29]

In *Mala Aggarwal* v. *Jagdish Kumar* compensation was increased from Rs 7,500 to Rs 75,000 in appeal.[30]

In *Mohinder Gupta* v. *Major Singh* the Tribunal awarded a compensation of only Rs 10,000 which was increased by the Punjab and Haryana High Court to Rs 36,700.[31]

In *Chandrashekhar Madhusudan* v. *Subas Shankar Shirke*, compensation awarded by the Tribunal was Rs 16,300 which was increased to Rs 69,300 in appeal.[32]

In *Anugrah Sharma* v. *Balbir Singh* compensation awards were increased from Rs 45,000 to Rs 1,00,000 in appeal.[33]

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[25] *Premlata Nilamchand Sharma* v. *Hirabhai Ranchhodbhai,* 1983 ACJ 290 (Guj).

[26] *Arunaben* v. *Mehmoodbhai Imamali Kaji,* 1983, ACJ 409 (Guj).

[27] *Pal Bus Service* v. *Surjit Kaur,* 1984 ACJ 91 (P and H).

[28] *MPSRT Corporation* v. S*udhakar* AIR 1968 MP 47.

[29] *Oriental Fire and General Ins Co Ltd* v. *Keval Kum*ar, 1983, ACJ 497 (P and H).

[30] *Mala Aggarwal* v. *Jagdish Kumar* 1992 ACJ 123: 1992 (2) TAC 531 (P and H).

[31] *Mohinder Gupta* v. *Major Singh* 1983 ACJ 760 (P and H).

[32] *Chandrashekhar Madhusudan* v. *Subas Shankar Shirke* 1982 ACJ 491 (Guj).

[33] *Anugrah Sharma* v. *Balbir Singh* 1992 ACJ 284: 1992 (1) TAC 630 (Del).

In *Jai Bhagwan* v. *Laxman Singh* compensation was enhanced from Rs 45,000 to Rs 80,000 in appeal.[34]

In Assam and Meghalaya SRT Corporation,[35] a case involving an accident, the tribunal fixed the compensation at Rs 55,000. Gauhati High Court, on the other hand, determined the compensation to be equal to Rs 1,74,000. There are too many such instances.[36]

As the above cited cases show, there are various kinds of uncertainties regarding the compensation awards. As a result, the damage awards in an adjudicated case cannot be taken as an indicator or precedence for the similar cases which might be litigated in future. Uncertainties regarding the compensation awards not only defeat the expressly stated objective of the law of torts, they cause at least two types of economic inefficiency.
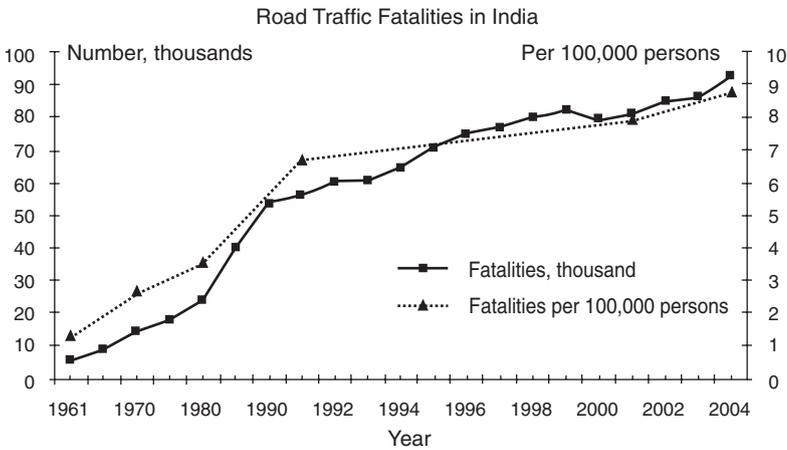
Consequences of Legal Changes in Motor Vehicle Act

In this subsection we look at the significance of actual factors involved behind road accidents through detailed econometric analysis. The following graph shows the trend of road traffic fatalities in India over the past 45 years.

This graph reveals that both the absolute number of fatalities (bold line) and the fatalities per 100,000 persons (dotted line) have been increasing monotonically. It is seen that the fatality risk (defined as road accidental deaths per 100,000 persons) has been continuously increasing over the years. Such high accident rates have even exceeded our annual population growth rates! During the period from 1991 to 1998, road accidental deaths have increased at the rate of 4.44 percent per annum while the population of the country has increased by only 1.92% per annum.

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[34] *National Insurance Co Ltd* v. *Savita* 1992 ACJ 245 (Raj).

[35] *Assam and Meghalaya SRT Corporation,* AIR 1988 Gua at 57, 58.

[36] See Bhatnagar (2004).

Road Traffic Fatalities in India

Source: IndiaStat.com*http://www.indiastat.com/India/*

Model 1

Dependent Variable: Total No. of Accidents (y_t)
Sample: 1973—1996

Variable	Co-efficient	Std. Error	t-Statistic	Prob.
C	67.317	10.525	6.396	0.000
Premium Collected. (x_{1t})	0.001	0.000	4.929	0.000
Total no. of vehicles (X_{2t})	0.006	0.001	4.731	0.000
Rise in road length over the previous year (X_{3t})	−0.100	0.035	−2.866	0.011
One pd. Lagged value of Total Accidents (X_{4t})	0.359	0.094	3.833	0.001
D1988	98.405	20.318	4.843	0.000
D1988*Road Length (X_{5t})	−0.051	0.011	−4.702	0.000

Note: The above model gives an account of the main factors (variables) that affect Road Accidents in India. The model has a good fit with R-squared =0.995 & Adjusted R-squared=0.993. Also the respective regression coefficients are BLUE because the model is free from Serial Correlation & Heteroscedasticity. All independent variables in the above equation are individually significant (at 5% level of significance)

We can interpret our regression coefficients as follows:

Total No. of Vehicles (X_{2t}):
It is positively related with the total number of accidents. This is fairly intuitive. Ceteris paribus, a rise in the number of vehicles leads to a higher number of accidents.

Rise in Road Length over the Previous Year (X_{3t}):
It is negatively related with the number of accidents. This is fairly intuitive because as road length rises, traffic congestion falls, which will leads to a fall in the number of accidents.

From an independent analysis, we can jointly interpret the above two variables in an interesting way. Road accidents in India are increasing since motor vehicle population is increasing at a greater rate than the expansion of road network. During the recent years the vehicular population in India is growing at the rate of 10% per annum. And as the table given below suggests, accident & fatality rate in India are as high as 80% & 20% respectively.

Table 1   Growth in Motor Vehicle Population & Road Accidents in India

Year	Road Accidents (in '000)	Persons Injured (in '000)	Persons Killed (in no.)	Vehicle Population (in '000)	Rate of Accident (per '0000 vehicles)	Rate of Death (per '0000 vehicles)
1995	214.4	266.5	68351	30286.9	70.8	22.6
1996	272.1	282.2	69800	33782.7	80.5	20.7
1997	290.9	309.5	74204	37231.5	78.1	19.9
1998	300	320.5	76732	37231.5	80.6	20.6

Source: Accidental Deaths & Suicides in India (National Crime Records Bureau, Govt. of India)

At this stage we can make an analysis of how safe our National Highways are compared to Other Roads. The magnitude of road traffic accidents, fatalities and injuries in India on all roads & national highways can be compared as:

Table 2   Magnitude of Road Traffic Accidents

Year	All Roads			National Highways		
	Accidents	Persons Killed	Persons Injured	Accidents	Persons Killed	Persons Injured
1999	386 456	81 966	375 051	103 839	28 713	98 427 (P)
2000	391 449	78 911	399 265	110 508	30 216	124 600
2001	405 637	80 888	405 216	115 824	32 108	119 592(P)
2002	407 497	84 674	408 711	131 738	33 621	132 307
2003	406 726	85 998	435 122	127 834	33 153	131 102
2004 (P)	429 910	92 618	464 521	130 265	34 723	143 140

Provisional (P) *Source: MoSRTH*

While the figure of fatalities may be close to the actual number of deaths in road accidents in India, the number of injuries reported appears to be underestimated. Various studies indicate that the actual number of injuries could be 15 to 20 times the number of deaths. The discrepancies in the number of deaths and injuries are a result of the application of different methodologies for the derivation of estimates. Furthermore, these figures do not account for growth in motor vehicle numbers in the coming years.

We can see from the above table that, National Highways comprise only 1.5 percent of the entire road network, but account for 25 percent of all accidents, and a shocking 34 percent of fatalities. Hence accidents are more likely to occur at national highways than other roads.

D1988

This is a dummy variable for the year 1988. This variable can be interpreted in the light of the Motor Vehicle Act, which was amended in 1988. The Motor Vehicle Act, 1939 was amended by the 1982 Amendment Act. As a result a new Motor Vehicle Act 1988 came into force from Oct, 1988. In this act were enacted Sections 140 to 144 (chapter 10 & corresponding to the earlier Sections 92–A to 92–E of the 1982 Act). Then, in 1994 this act was amended by the Amendment Act 54 of 1994. This new amended act came into force in Nov, 1994. We want to know what impact did amendments to the original Motor Vehicle Act in 1988 & 1994 have on total road accidents (& total road accidents controlled by the number of vehicles) in that corresponding year & then onwards. After these amendments, compensation based on no-fault liability & Compulsory Third Party Insurance has become prominent features of the Motor Vehicle Act. These two clauses & their impact upon Total Road Accidents can be interpreted as:

The Principle of No Fault Liability

This principle says that after an accident the injured should immediately compensate the victim no matter which party (the injured &/or the injurer) was at fault during the accident.

Thus this principle increases the injurer's liability towards the victim. Hence the injurer will now become more careful while driving. Hence the Total Road Accidents should fall. Hence we have the following Hypothesis:

Hypothesis 1A: Implementation of the Principle of No Fault Liability will Reduce Total Road Accidents.

Compulsory Third Party Insurance Regulation: This regulation makes it mandatory for every vehicle owner to buy a Compulsory Insurance Policy. Accordingly, now the insurer will be liable to compensate the Third Party (for death/permanent disablement/

bodily injury) for losses suffered in an accident in which the insured owns the offending vehicle. Thus, this regulation absolves the injurer (insured) from bearing the burden of compensation made to the Third Party. Thus the injurer might become more negligent while driving due to the moral hazard effect. Thus Total Road Accidents will increase. Hence we propose the following Hypothesis:

Hypothesis 1B: Compulsory Third Party Insurance Regulation increases Total Road Accidents.

Since the amendments to the original Motor Vehicle Act in 1988 introduced both the principle of No Fault Liability & Compulsory Third Party Insurance Regulation simultaneously, the net impact on Total Road Accidents can be seen from our results (in the above model).

The co-efficient of D1988 is positive indicating that, ceteris paribus, accidents are higher since 1988. Thus Hypothesis 1B dominates Hypothesis 1A. This means that Compulsory Third Party Insurance has moral hazard implications. Such insurance makes the insured drivers more reckless because now they are insured against any third party liability they might become liable to pay.

If accidents are lower after 1988 (according to the above argument) then there should be a structural break in the Total Road Accidents in 1988. We confirm this result by applying Chow Break test upon the Simple Regression equation of Total Road Accidents upon No. of Vehicles (X_{2t}). (See Appendix 3). It can also be noted here that we have not included any dummy variable for year 1994 in our above model. This is because this variable casts an insignificant influence upon total number of accidents & hence we removed it from our final model. Also from the Chow Break Point test we don't find any structural break at 1994. (See Appendix 3). This means that incorporation of Section 163(A) & 163(B) in 1994 in Motor Vehicle Act did not lead to any structural change in Total Road Accidents.

One Period Lagged Value of Total Accidents (X_{4t})

This variable is significant & positive. Total Accidents have always increased monotonically in India. Hence current number of Total Accidents is a good enough variable to forecast the future value of Total Accidents.

D1988*Road Length (X_{5t})

This is an interaction variable. Its co-efficient is negative. It means that after 1988, development of infrastructure (here road length) is more effective in reducing road length than earlier. This might be because of adoption of superior technology in developing infrastructure (example: better flyovers, over bridges etc). A more convincing argument is that there has been improvement in Road Safety Mechanism after 1988. The Motor Vehicles Act of 1988 mandated that each State should have a Road Safety Council (SRSC) headed by the Minister in charge of Transport for the state government on the lines of the National Road Safety Council.

Premium Collected (X_{1t})

It is positively related with the number of accidents. This result can be interpreted through the following arguments. The impact of Insurance Premium on Total Accidents:

Premium Collected affects Total Road Accidents

If a higher premium is charged by the Insurance Company then it must be that the Insurance Company is charging higher premium in exchange for agreeing to bear a larger part of the Third Party Compensation which the insured becomes liable to pay. Hence the insured (injurer) will become more negligent. Hence the Total Road Accidents will increase. Hence we propose the following hypothesis:

Hypothesis 2: Premium Collected Positively Affects Total Road Accidents.

Total Road Accidents Affect Premium Collected

After the amendments to the original Motor Vehicle Act in 1988 or 1994, the injurer has become more negligent. Hence the insurance companies are now paying out larger amount of money as compensation to the third party (victim). Given the concept of loading (where higher premium is charged on a vehicle next year if it meets with an accident in the current year) applicable on premium rates in India, the insurance companies will now charge a higher premium on Motor Vehicle Insurance.

Hence we have the following hypothesis:

Hypothesis 3: Total Road Accidents Positively Affects Premium Collected.

If both these hypotheses are jointly true, then we can expect that the following hypothesis will hold true:

Hypothesis 4: Premium Collected Leads to the Problem of Simultaneity when Total Road Accidents is Regressed on Premium Collected (& Other Variables)

To test for Hypothesis 2, we regress Total no. of Accidents (Y_t) upon Premium Collected (X_{1t}). The model is as follows:

Dependent Variable: Total No. of Accidents (Y_t)
Sample (adjusted): 1973 1997

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	143.0908	7.3393	19.4966	0.0000
Premium Collected (X_{1t})	0.0004	0.0000	14.3305	0.0000

Interpretation

The model is a good fit (R-squared = 0.90 & Adjusted R-squared = 0.89). Also the model is free from Serial Correlation & Heteroscedasticity.

Since the coefficient of Premium Collected (X_{1t}) is positive & significant, Hypothesis 2 holds true.

To test for hypothesis 3, we regress Premium Collected (X_{1t}) upon Total Accidents (Y_t) & some other variables like Rise in Per Capita Income over the previous year (X_{7t}) & Bank Rate (X_{8t}). The results are:

Dependent Variable: Premium Collected (X_{1t})
Sample (adjusted): 1973 1997
Included observations: 25 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	−36567.49	8821.10	−4.15	0.00
Rise in per capita Income over the previous year (X_{7t})	−18.03	14.82	−1.22	0.24
Total Accidents (Y_t)	517.03	89.78	5.76	0.00
Bank Rate (X_{8t})	−2996.81	850.62	−3.52	0.00

Interpretation

The model is a good fit (R-squared = 0.91 & Adjusted R-squared = 0.90). Also the model is free from Serial Correlation & Heteroscedasticity. Since the coefficient of Total Accidents (Y_t) is positive & significant, Hypothesis 3 holds true.

Since both Hypotheses 2 & 3 hold, Hypothesis 4 also holds. Thus regarding the influence of Premium Collected on Total Accidents we can conclude that:

- Premium Collected positively affects Total Road Accidents
- Premium Collected leads to the problem of simultaneity when

Total Road Accidents is regressed on Premium Rate (& other variables)

Thus intuitively we have argued that Hypothesis 4 holds. This can also be econometrically tested through the Hausman Test. The Hausman Test confirms that Premium Collected is an endogenous variable. (See Appendix 2). This suggests that the fit of our model will improve if we apply Two Stage Least Square (2SLS) estimation procedure to estimate our model. Before doing so, we also need to check if any other independent variable is endogenous. We suspect Total no. of Vehicles (X_{2t}) to be endogenous. We expect it to be influenced by Rise in road length over the previous year (X_{3t}), Total no. of Accidents (y_t) & Rise in per capita Income over the previous year (X_{7t}). Hence we regress Total number of Vehicles (X_{2t}) upon these variables to obtain the following result:

Dependent Variable: Total No. of Vehicles (X_{2t})
Sample (adjusted): 1973 1997
Included observations: 25 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	–8504.66	1590.15	–5.35	0.00
Rise in road length over the previous year (X_{3t})	6.30	8.96	0.70	0.49
Rise in per capita Income over the previous year (X_{7t})	10.56	3.05	3.47	0.00
Total no. of Accidents (Yt)	73.16	11.00	6.65	0.00

Interpretation

The model is a good fit (R–squared = 0.98 & Adjusted R–squared = 0.98). Also the model is free from Serial Correlation & Heteroscedasticity. Also the signs of all independent variables are as expected. To check for endogenity of Total no. of Vehicles (X_{2t}) we use Hausman Test. The Hausman Test shows that Total no. of Vehicles

(X_{2t}) is exogenous. Thus, we now apply 2SLS to our model with the knowledge that only Premium Collected is an endogenous variable in this model. These results are as follows:

Model 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Dependent Variable: Total No. of Accidents (Y_t)				
Sample (adjusted): 1973 1997				
Included observations: 25 after adjusting endpoints				
Constant	60.363	8.973	6.727	0.000
Total no. of vehicles (X_{2t})	0.005	0.001	3.718	0.003
Rise in road length over the previous year (X_{3t})	−0.095	0.040	−2.393	0.033
D1988	94.461	15.297	6.175	0.000
D1988★Road Length (X_{5t})	−0.048	0.008	−5.683	0.000
Premium HAT (X_{8t})	0.001	0.000	3.891	0.002
One pd. Lagged value of Total Accidents (X_{4t})	0.432	0.081	5.354	0.000
AR(1)	−0.578	0.317	−1.822	0.092
AR(2)	−0.257	0.333	−0.772	0.454

Interpretation

The model is a good fit (R-squared = 0.994 & Adjusted R-squared = 0.991). Also the model has been corrected for Serial Correlation & the model is free from Heteroscedasticity. This model is the same as model 1 except that Premium Collected (X_{1t}) has been replaced by its estimated value Premium HAT (X_{8t}) & that the above model is estimated by 2SLS technique unlike model 1 which was estimated through OLS technique. But all other independent variables are the same as in the earlier model & have the same signs as before. Hence this model can be interpreted in the same way as we interpreted the earlier model. But since model 2 has been corrected for endogenity,

this model is better than model 1. Now we regress the Total number of Accidents controlled by the number of vehicles and the result is as follows:

Model 3

Dependent Variable Number of Accidents/No. of Vehicle (in '000)
Sample: 1973 1996

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	46.06	3.52	13.09	0.00
Premium Rate (X_{1t})	47.85	20.29	2.36	0.03
Total no. of vehicles (X_{2t})	0.00	0.00	−10.45	0.00
D1988	−68.99	9.70	−7.12	0.00
D1988★Road Length (X_{5t})	0.04	0.00	7.86	0.00

Interpretation

Model 3 has a good fit (R-squared = 0.94 & Adjusted R-squared = 0.92). Also the model is free from Serial Correlation & Heteroscedasticity. This model can also be interpreted in the way we interpreted the previous models 1 and 2. The only surprising thing is that the co-efficient of D1988 is negative. This is simply because after 1988, the vehicle population has increased at a faster rate than Total Accidents.

State-Specific Regression Analysis

In this section we want to make an inter-state comparison of total road accidents. To start with, we present the following hypothesis:

Hypothesis: Road length is a proxy for infrastructure in a state. Hence rise in road length should lead to a fall in total road accidents.

To test this hypothesis, we have taken data on Andhra-Pradesh (which is our reference state), Bihar, Tamil Nadu, Punjab & Maharashtra for

11 years (1994–2005). Here the dependent variable is Total Road Accidents (state specific) and independent variables include Total Road Length (in log form) & state specific dummy variables.

Our results are as follows:

Dependent Variable: Total Accidents (state level)
Sample: 1994 2005
Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	−75675.15	44714.69	−1.69	0.10
LN (State level road length)	8466.826	3683.51	2.30	0.03
DBihar	−15346.14	3261.21	−4.71	0.00
DMaharashtra	38335.45	3290.65	11.65	0.00
DPunjab	−14718.34	4180.25	−3.52	0.00
DTamilNadu	18582.17	2038.38	9.12	0.00

Interpretation

The above model is not a good fit. The independent variable ln(road length) is rising over time & there exists positive serial correlation in the error terms. This means that our R^2 is an over-estimate & the t-statistic of ln(road length) is an under-estimate. Hence the estimated variances of the parameters in our regression model are biased & inconsistent.

To improve the fit of this model we include the following variables in the above model:

- Total number of vehicles
- Per Capita Income
- Per Capita Alcohol Consumption

(All these variables are in state level)

The results obtained are as follows:

Dependent Variable: Total Accidents (state level)
Sample: 1994 2005
Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	19386.39	51017.69	0.38	0.71
LN (Total Vehicles)	0.01	0.00	6.06	0.00
LN(State level road length)	−1917.34	4482.92	−0.43	0.67
LN (Per Capita Income)	1.72	0.49	3.50	0.00
LN (alcohol consumption)	−2.41	1.00	−2.42	0.02
DBihar	−474.55	2298.26	−0.21	0.84
DMaharashtra	17393.45	4730.86	3.68	0.00
DPunjab	−18281.28	6857.04	−2.67	0.01
DTamilNadu	4913.08	1877.19	2.62	0.01

Interpretation

The above model is also a bad fit. Although this model does not display any serial correlation, the problem in the above model is that

Dependent Variable: Total Accidents

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	−281090.90	35854.25	−7.84	0.00
LN (Total Vehicles)	10200.83	1817.60	5.61	0.00
LN (Per Capita Income)	21178.92	3600.68	5.88	0.00
LN(alcohol consumption)	5473.42	1300.85	−4.21	0.00
DBihar	10452.35	4197.73	2.49	0.02
DMaharashtra	34867.56	2667.46	13.07	0.00
DPunjab	−8708.59	4645.75	−1.87	0.07
DTamilNadu	10353.82	1698.64	6.10	0.00

the error terms are heteroscedastic. This means that our regression coefficients are no longer BLUE & are also inefficient. We dropped Per Capita Income from the above model but did not observe any improvement in the fit. But when we dropped Ln(road length), our results are as follows:

Interpretation

Finally, we obtained a model which is a good fit (R-squared = 0.988 & Adjusted R-squared = 0.987). Also the model is free from Serial Correlation & Heteroscedasticity.

The last 4 variables are the Dummy Variables for the respective states.

The coefficients of LN (Total Vehicles), LN (Per Capita Income), LN (alcohol consumption) are positive as expected.

- Thus rise in per capita alcohol consumption leads to a rise in total accidents. Specifically, we can confirm econometrically that drunk drivers are a menace & are more prone to accidents. Currently there is insufficient punishment for them which, by stands currently at Rs. 2000 and/or imprisonment upto six months. According to experts, even one peg of alcohol (approximately 30ml at 42.8 percent by volume or greater) can impair judgments and reduce reaction times for up to three hours.
- Rise in total number of vehicles leads to more congestion on the roads & hence more accidents.
- Finally, rise in per capita income leads to greater expenditure on purchasing vehicles & fuels, hence more congestion on the roads & hence more accidents.

Unfortunately, for econometric reasons we could not capture the effect of road length on total road accidents.

Also controlling for these 3 independent variables we can conclude that compared to Andhra-Pradesh, accidents will be higher in Bihar, Maharashtra & Tamil Nadu but lower in Punjab. This result

can be attributed to unknown exogenous factors like lawlessness, attitude of drivers etc. Finally, we replace the dependent variable in the above equation with total accidents per 1000 vehicles. The results are as follows:

Dependent Variable: Total Accidents/Vehicle ('000) (state level)
Sample: 1994 2005
Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	9.61	2.28	4.21	0.00
LN (Total Vehicles)	0.0005	0.00	−2.52	0.01
LN (Per Capita Income)	0.0021	0.00	2.47	0.02
LN(alcohol consumption)	0.0013	0.00	−1.96	0.06
DBihar	2.09	1.69	1.24	0.22
DMaharashtra	8.48	3.72	2.28	0.03
DPunjab	−7.62	2.99	−2.55	0.01
DTamilNadu	2.40	1.50	1.60	0.12

Interpretation

The independent variables in the above model can be interpreted in a similar way as compared to the model where our dependent variable was total accidents. But although this model does not suffer from Serial Correlation & Heteroscedasticity, the model is a poor fit because R-squared is only 0.23.

CONCLUDING REMARKS

As Indian economy has progressed, economic activities like use of motor vehicles, transportation, construction, etc., have become numerous as well as complex. These activities pose risk for people involved. In addition, in many instances, these activities inflict losses

that are external to the parties directly involved in these activities. For example, people engaged in driving of motor vehicles create risk not only for fellow drivers but also for pedestrians. In this paper we have studied how the Indian legal position with respect to such activities has evolved with the economic development of Indian economy. We have analyzed formal legislative changes in the law as well as those changes that have been brought about by judicial interpretation of the legislated law. The cases analyzed in this study, though limited in number can be taken as representative of judicial decision making. Our analysis shows that there have been changes in the Indian liability rules over time. These changes have made the rules more compensatory in nature. Whether it is the instance of product caused injuries or that resulting from motor accidents, the injurers' liability has increased over time. Some of these changes have come from the legislation. Other interesting changes have been brought about by interesting and innovative legal interpretations by Indian courts, while adjudicating motor and other accident cases. Indian courts have appealed to the rules that have been shown to be efficient in the economic analysis of liability rules. Therefore, one would expect the 1988 amendment to the Motor Vehicle Act to reduce number of accidents.

We have tested this conjecture by studying the time series data on number of road accidents in India. Our study shows that as a result of 1988 amendment to the Motor Vehicle Act there was a structural and downward shift in accident rate in 1988/89 if we focus on number of accidents per thousand vehicle. However, if we measure accident intensity by either total number of accidents or by number of accidents per lac population, we find that the 1988 amendment to the Motor Vehicle Act did not make Indian roads any safer.

There are several reasons. The way liability rules have been applied by Indian courts renders them inefficient. For instance, there has been a large variance in the compensation awards, even in very similar accident cases. This is partly due to the fact that different courts have

adopted different methods while calculating the compensation. Also, even in the very same case, different courts have awarded different compensation, when an appeal was made against the initial awards. This has resulted in various kinds of uncertainties regarding the compensation awards. Such uncertainties defeat the stated objective of the law of torts. In fact, they cause economic inefficiency on several counts. Uncertainties, among other things, reduce the chances of out-of-court settlement, and cause more litigation. We have demonstrated that uncertainties result in an avoidable wastage of resources. Indeed, uncertainties raise the following fundamental question: What is the law of the land? Many of such uncertainties can be reduced significantly, if courts make use of the relevant tools and techniques developed in the field of economics and statistics. Courts in the US and Western Europe have proved the same.

Apart from such errors there are other factors also that can affect the liability payments made by injurers and therefore efficiency of a liability rule. For example, if injurers can at times escape liability for the harm they have inflicted then they will internalize only a part of the externality and will be less careful. Similarly, judgment-proofness or limited wealth of injurers and statutory limits on the amount of liability are likely to under-deter them.

Therefore, gains from the liability changes brought about have dissipated due to the uncertainty caused by conflicting court judgments. Also, the real value of fines has depreciated over time. As a result, the number of accidents has gone up from 2,46,700 in 1988 to more than 4 lacks in 2007. The actual number is much larger since many accidents go unrecorded.

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APPENDIX

1. Total no. of vehicles (X_{2t}) is an exogenous variable.

Dependent Variable: Total no. of Accidents (Y_t)
Sample (adjusted): 1973 1997
Included observations: 25 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	91.444	13.257	6.898	0.000
Total no. of vehicles (X_{2t})	0.008	0.001	5.943	0.000
Rise in road length over the previous year (X_{2t})	−0.146	0.036	−4.113	0.001
Premium Collected (X_{2t})	0.001	0.000	5.019	0.000
D1998	90.220	18.011	5.009	0.000
D1988★ Road Length (X_{5t})	−0.047	0.010	−4.830	0.000
One pd. Lagged value of Total Accidents (X_{4t})	0.177	0.109	1.624	0.124
R	−0.004	0.002	−2.522	0.023
R-squared	0.966	Men dependent var		211.93
Adjusted R-squared	0.944	S.D. dependent var		77.55
S.E. of regression	5.802	Akaike info criterion		6.62
Sum squared resid	538.637	Schwarz criterion		7.01
Log likelihood	−71.386	F-statistic		584.64
Durbin-Watson stat	2.561	Prob (F-statistic)		0.00

Interpretation

The p-value of R is greater than 0.01. Hence the residual is significant at 1%. This means that (X_{2t}) is an exogenous variable.

2. Premium Collected (X_{1t}): It is an exogenous variable

Dependent Variable: Total no. of Accidents (Y_t)
Sample (adjusted): 1973 1997
Included observations: 25 after adjusing endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	75.564	7.942	9.514	0.000
Total no. of vehicles (X_{2t})	0.005	0.001	5.847	0.000
Premium Collcted (X_{1t})	0.001	0.000	7.326	0.000
Rise in road length over the previous year (X_{3t})	−0.055	0.028	−1.982	0.065
One pd. Lagged value of Total Accidents (X_{4t})	0.288	0.071	4.083	0.001
D1988	110.607	15.117	7.317	0.000
D1988★Road Length (X_{5t})	−0.059	0.008	−7.217	0.000
R	−0.001	0.000	−4.001	0.001
R-squared	0.997	Mean dependent var		211.925
Adjusted R-squared	0.996	S.D. dependent var		77.547
S.E. of regression	4.849	Akaike info criterion		6.257
Sum squared resid	376.237	Schwarz criterion		6.649
Log likelihood	−67.081	F-statistic		837.988
Durbin-Watson stat	2.803	Prob (F-statistic)		0.000

Interpretation

The p-value of R is less than 0.01. Hence the residual is insignificant at 1%.

This means that (X_{1t}) is an endogenous variable.

3. Chow Break Point Test

Dependent Variabl: Total No. of Accidents (Y_t)
Sample (adjusted): 1973 1997
Included observations: 25 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	120.18	5.54	21.70	0.00
Total no. of vehicles (X_{2t})	0.01	0.00	22.78	0.00
R-squared	0.96	Mean dependent var		218.40
Adjusted R-squared	0.96	S.D. dependent var		82.52
S.E. of regression	17.37	Akaike info criterion		8.62
Sum squared esid	6938.87	Schwarz criterion		8.72
Log likelihood	−105.80	F-statisti		518.74
Durbin–Watson stat	0.60	Prob (F-statistic)		0.00
Chow Breakpoint Test: 1988				
F-statistic	11.97	Probability		0.00
Log likelihood ratio	19.02	Probability		0.00

Here we do not have any structural break in the year 1988