Introduction

by Göran Skogh*

A serious problem in modern society is that wealth-increasing new technology tends to be hazardous. The limited information about potential accidents results in a more or less arbitrary victimization and in a misallocation of resources. One possible solution is to impose cost liability on the injurer together with private insurance. Another is collective coverage of accident costs and public safety regulation.

Most actual systems are mixes of these private and public solutions. For instance, losses from traffic accidents are partly covered by public insurance such as public health care and pension schemes, partly covered by private liability and insurance and partly spread among victims and their families. Accident-related behaviour is affected by safety regulation, punishment, personal liability, and the withholding of insurance claims. Similarly, costs due to accidents at sea are partly covered by the public, partly by marine insurance, and partly by individuals. The sea-map and the captain's instructions contain many rules that must be followed. The insurance policy also contains regulations concerning the stowing, the cargo and the route to follow. The picture is the same for building construction, drug production, air transport, and environmental hazards. With a catastrophe like the Sandoz accident, a substantial part of the costs are in effect covered by the public either via taxes or randomly. This accident raises the question whether the regulation of the chemical industry is adequate.

A most important and challenging task for the social scientist is to analyse the impact of different systems for the prevention of accidents and the compensation of victims. The simultaneous presence of liability, insurance, and safety regulation complicates the analysis; the benefits and costs of a certain control measure or compensation scheme must be evaluated with respect to impacts on all parts of the system. However, economic models typically analyse single methods of regulation or compensation separately. For instance, economic analyses of environmental hazards normally abstract from risk aversion, safety regulation is rarely considered in studies of product liability, and the insurance literature usually neglects safety regulation. The legal literature exhibits a similar splitting into sub-fields; regulation is part of administrative law and to some extent criminal law, liability is part of tort law, and insurance is part of contract law.

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However, there are important exceptions in the growing literature in *law and economics*, where cost liability, insurance, and safety regulation are sometimes compared¹. In the seminal book "The Costs of Accidents", Guido Calabresi (1970) analyses alternative compensation schemes. Donald Wittman (1977) presents a general study of the comparative benefits and costs of regulation versus liability. Mitchell Polinsky and Steven Shavell (1979) analyse the optimal tradeoff between the probability and magnitude of fines. By assuming risk averse offenders as well as victims, they include insurance. Göran Skogh and Charles Stuart (1977) and Steven Shavell (1979) compare public insurance, tort liability, and private insurance. Skogh (1982) compares taxes, tort liability and regulation upheld by punishments. Shavell (1984a) analyses the optimal use of liability and safety regulation. Arnott and Stiglitz (1986) study public insurance in combination with commodity taxation.

A better understanding of the functioning of different schemes of compensation and safety regulation is of vital importance in our technically advanced and risky world. Hence, the research must continue and develop. It is also important with research outside Anglo-Saxon countries. So far, most of the research on liability rules, insurance, and safety regulation has been American or British. The importance of the subject has become more widely recognized, however, and today there is also a great interest in *law and economics* in continental Europe.

The European Association for Law and Economics² (EALE) promotes research in Law and Economics and the Association Internationale pour l'Etude de l'Economie de l'Assurance (the Geneva Association) supports new approaches to research on risk and insurance. Therefore, it was natural for the two organisations to arrange a joint conference on the theme "Liability, Insurance and Safety Regulation". The meeting was held in Geneva 7-8 April 1986. The papers in this issue of the Geneva Papers on Risk and Insurance are a collection of the contributions at this conference.

In the first paper, Michael Faure and Roger Van den Bergh analyse negligence, strict liability, and direct regulation of safety in Belgian law. They first survey the economic theory of tort law. Economic models have been mainly for analysis of common law. Here, the analysis is extended to civil law concepts such as the *bonus pater familias*. Faure and Van den Berg test whether Belgian tort law can be interpreted according to economic liability concepts such as the Hand rule. They conclude that economic models do fit Belgian civil law. Deviations from the simple economic model of incentives can partly be attributed to distributional considerations: Belgian legal doctrine stresses a goal of protecting victims. As well, the absence of strict liability for some ultrahazardous activities can be explained by political considerations.

1. Application of economic theory to law has undergone rapid development. The *law and economics* literature covers most aspects of the legal system, e.g. property, contracts, tort, legal procedure, criminal law, public law, and regulation. For a survey of the "New Law and Economics", see Veljanovski (1982). An introductory text-book is "Readings in the Economics of Law and Regulation" by A. Ogus and C. Veljanovski (1984). The classic in the field is "Economic Analysis of Law" by R. Posner (1977). For a bibliography on writings on tort law, see Veljanovski (1984).

2. The European Association for Law and Economics (EALE) was founded in 1984 in Lund, Sweden. The EALE organises meetings and distributes information to researchers. Persons interested in further information are welcome to write to EALE, The Department of Economics, University of Lund, Box 5137, S-220 05 Lund, Sweden.

The second paper is "Accidents, Taxes, Liability Rules, and Insurance", by Hugh Gravelle. It models activities such as driving, which carry the risk of an accident with another individual involved in the same activity. Risk-averse individuals wish to insure themselves. However, insurers cannot easily observe the amount of care taken by an insured individual. There are two potential efficiency justifications for government intervention in this situation. First, each individual may ignore the part of the total accident cost that falls on others. Second, there is an externality arising from the insurance contract. That is, with moral hazard, the insured does not take full account of impacts on the insurer's expected costs. The State may be able to monitor and control the level of care in ways that are not available to individuals or insurers. It can, for example, set safety standards and enforce them by policing. It may also shift the costs falling on individuals as a result of accidents. Similarly, the price of care can be altered by taxes or subsidies. The policies examined in the paper include allocation of accident costs via accident taxes and liability rules, taxation of care, and restrictions of private insurance. A recent paper by Arnott and Stiglitz (1986) examines how commodity taxes and subsidies can improve efficiency in the presence of moral hazard. However, the latter authors assume government insurance and unilateral accidents only. Hence they neglect private insurance and the liability problem analysed by Gravelle.

In the third paper, "Moral Hazard and Safety Regulation" Ingemar Hansson and Göran Skogh examine externality control and moral hazard both in a private market system with liability and insurance and in a public system with insurance and regulation upheld by random punishment of offenders. The paper is complementary to Gravelle's. The analysis extends earlier studies in two ways. First, the writers point out that the insurer can reduce moral hazard by withholding claims when the terms of the policy are violated. Second, they examine public insurance and regulation with an explicit "second-best" analysis of the simultaneous determination of optimal legal regulation and optimal punishment. Under some conditions, the optimal solution is to apply punishments for a minority that do not alter their behaviour, but regulate the behaviour of the majority.

The fourth contribution contains an analysis of the development of civil liability insurance for marine oil pollution damages. In it Jan Bongaerts and Aline De Bievre discuss the compensation problem and the financial arrangements developed by tanker owners and oil receivers. These arrangements arose both voluntarily and due to regulatory forces. Data suggest that full compensation of victims is not met in case of severe accidents with high clean-up costs because liabilities are limited by statute. The writers find that the regulation of accidents by the screening of risk performance by ship-owners and by their mutual insurance institutions occurs to an insufficient degree. Public intervention of some sort, as examined in the papers by Gravelle and Hansson and Skogh, is therefore needed.

The final paper, "Evaluating Irreplaceable Loss: Some Implications for Insurance and Liability Rules", by Paul Fenn extends the analysis of Cook and Graham (1977) in which the consumers demand for insurance against irreplaceable loss is examined. The paper offers an explanation based on conventional expected utility theory, for some of the more puzzling results of recent experimental work which suggests substantial differences between willingness to pay and compensation demanded measures of welfare loss. It is suggested that these results can be explained by reference to the complementarity and substitutability characteristics of goods in contexts where replacement is not possible. The paper concludes with some implications of its results for rules concerning compensation for breach of contract and efficient deterrence.

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