

Chicago-Kent Law Review

Volume 91

Issue 2 *Causation, Liability and Apportionment:
Comparative Interdisciplinary Perspectives*

Article 10

5-16-2016

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Recommended Citation

Michael Faure, *Attribution of Liability: An Economic Analysis of Various Cases*, 91 Chi.-Kent L. Rev. 603 (2016).
Available at: <https://scholarship.kentlaw.iit.edu/cklawreview/vol91/iss2/10>

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ATTRIBUTION OF LIABILITY: AN ECONOMIC ANALYSIS OF VARIOUS CASES

MICHAEL FAURE*

I. INTRODUCTION

The traditional approach to torts, both legal and economic, has always started from a simple premise, which assumes one tortfeasor, one victim, and a clear causal relationship between the tortious conduct of the tortfeasor and the damage suffered by the victim. However, in reality there can be many deviations from this classic case. One such deviation is where the causal relationship in the simple case of a single possible tortfeasor and victim is not clear. Other deviations may occur when there is a multitude of contributing tortfeasors and/or victims and the question arises whether a tortfeasor should be held liable for the entire injury to a particular victim when others also tortiously contributed and/or when there are multiple victims. The liability issue is especially complicated when there are multiple tortfeasors and/or victims and there is uncertainty concerning the contribution of each tortfeasor to each victim's injury.

In some cases, the legislature allocates liability exclusively to one party through so-called channeling of liability. Legal channeling of liability (for example, in international conventions with respect to nuclear liability) exclusively allocates liability to one party (e.g. the licensee of a nuclear operator) and excludes liability suits against others. Vicarious liability is another instance where someone other than the tortfeasor may also, or instead, be held liable. This occurs when a superior (like an employer) is held liable for acts of a subordinate (an employee).

The goal of this article is to discuss some of the aforementioned cases of attribution of liability that deviate from the classic case (i.e. one injurer causing damage to one victim). This article makes an inventory of those deviations and discusses to what extent the legal solutions make sense from an economic perspective. This article uses economic analysis of both acci-

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dent law and comparative law, and therefore is a contribution to comparative law and economics.

After an introduction, Section II discusses the economic starting points for attribution of liability and, more generally, sketches the goals of accident law. The next two sections discuss cases of multiple tortfeasors. Section III analyzes how domestic tort law in various jurisdictions deals with accidents caused by multiple tortfeasors. In this section, specific attention is paid to the *Principles of European Tort Law* (PETL) drafted by the European Group on Tort Law. Section IV analyzes accidents caused by multiple tortfeasors in a law and economics framework. This Section specifically examines the circumstances under which so-called “solidary liability” (often referred to as joint and several liability) can be justified. This Section makes a distinction between a case involving full solvency of the various tortfeasors and a case with possibly insolvent tortfeasors. Section V then discusses the phenomenon of channeling of liability. This section provides a variety of examples of channeling from international conventions and provides an insurability perspective. It also studies some reasons and justifications for channeling of liability. Finally, Section VI—for the sake of completeness—briefly addresses the case of vicarious liability. This section explains the phenomenon and considers the precise economic rationale of vicarious liability.

This article, which focuses on attribution of liability while taking into account causal uncertainty, is written from both comparative legal and economic perspectives. It gives equal attention to the issue of how various solutions (such as channeling or joint and several liability) may affect the insurability of the risk.

II. ECONOMIC STARTING POINTS

There is a remarkable difference between the way in which traditional lawyers view the liability system and the way in which it is viewed from an economic efficiency perspective. Traditional tort lawyers view the tort liability system as being aimed at preventing or at least compensating unjust injuries.¹ From that perspective, victim protection and more particularly *ex post* compensation of victims is the major goal of accident law.² In that view, liability rules clearly aim to compensate victims and the bench-

1. See, e.g., LOUIS VISSCHER, *DEBATED DAMAGES* 14 (2015) (discussing the tort liability theory of the Dutch lawyer Bloembergen, who regards compensation as the “central goal” of the law of damages); Richard W. Wright, *Justice and Reasonable Care in Negligence Law*, 47 AM. J. JURIS. 143, 163–70 (2002).

2. VISSCHER, *supra* note 1.

mark by which a liability system will be judged is whether it is able to provide this compensation.³

An economic analysis of accident law takes a different perspective. Economists stress that the exposure to liability of a potential injurer will provide incentives for accident prevention.⁴ The central idea is that actors (predominantly industrial operators, but also others) will react to a potential exposure to efficiently designed liability by taking optimal preventive measures.⁵ In this perspective, the goal of the liability system is not *ex post* compensation, but rather *ex ante* prevention. “Prevention is better than cure” is the guiding principle for the economic analysis of law.⁶ This starting point has two important consequences. First, the idea is that when operators are not exposed to the financial consequences of their actions via a liability rule, their incentives for prevention will fail, unless other legal rules (i.e. regulation) would provide an alternative.⁷ Second, an equal consequence is that exposing an operator to efficiently designed liability *ex post* (after the accident) will provide an *ex ante* incentive to take optimal care.⁸ Thus, from an economic perspective, a liability system has an important social function in remedying market failures.⁹

At the end of last century, there were fierce debates between economists and lawyers on the goals of tort law and some attempts were made to reconcile the traditional legal (corrective justice) approach with the economic (efficient deterrence) approach.¹⁰ Now, especially in the environmental arena, the legal community and policymakers have become more and more convinced of the importance of liability rules as an instrument of

3. See Michael Faure & Ton Hartlief, *Social Security Versus Tort Law as Instruments to Compensate Personal Injuries: A Dutch Law and Economics Perspective*, in THE IMPACT OF SOCIAL SECURITY LAW ON TORT LAW 22–25 (Ulrich Magnus ed., 2003).

4. See Steven Shavell, *Strict Liability Versus Negligence*, 9 J. LEGAL STUD. 1, 2–3 (1980); see also STEVEN SHAVELL, ECONOMIC ANALYSIS OF ACCIDENT LAW 5 (1987) [hereinafter SHAVELL, ECONOMIC ANALYSIS].

5. GUIDO CALABRESI, THE COSTS OF ACCIDENTS. A LEGAL AND ECONOMIC ANALYSIS 24–28 (1970).

6. See VISSCHER, *supra* note 1, at 16.

7. See WILLEM H. VAN BOOM, TORT LAW AND REGULATORY LAW (Meinhard Lukas & Christa Kissling eds., 2007) for a discussion on how regulation and tort law could mutually work together to provide incentives for care and contribution.

8. See SHAVELL, ECONOMIC ANALYSIS, *supra* note 4, at 5–7.

9. For a discussion of the economic analysis of environmental liability and the role of tort law in that respect see LUCAS BERGKAMP, LIABILITY AND ENVIRONMENT: PRIVATE AND PUBLIC LAW ASPECTS OF CIVIL LIABILITY FOR ENVIRONMENTAL HARM IN AN INTERNATIONAL CONTEXT 67–119 (2001); KRISTEL DE SMEDT, ENVIRONMENTAL LIABILITY IN A FEDERAL SYSTEM: A LAW AND ECONOMICS ANALYSIS 28–64 (2007); MARK WILDE, CIVIL LIABILITY FOR ENVIRONMENTAL DAMAGE: COMPARATIVE ANALYSIS OF LAW AND POLICY IN EUROPE AND THE US 138–48 (2d ed. 2013).

10. See Gary Schwartz, *Mixed Theories of Tort Law: Affirming both Deterrence and Corrective Justice*, 95 TEX. L. REV. 1801, 1801–34 (1997).

efficient and/or just prevention.¹¹ One of the reasons for this change is due to the availability of increasing empirical evidence, demonstrating that industrial operators respond to financial incentives provided through the liability regime.¹²

III. MULTIPLE TORTFEASORS IN THE LAW

This Section addresses how the law generally deals with a situation involving multiple tortfeasors. It starts by providing two examples of quite different situations and then explains the basic approach to liability in each situation in many legal systems as well as the justifications for that approach. In Europe, multiple tortfeasors have been dealt with in the so-called *Principles of European Tort Law* proposed by the European Group on Tort Law (of which the author is a member), which also merits discussion. Finally, this section discusses the issue of contribution between multiple tortfeasors held liable for the same injury.

A. Two Examples

Cases involving multiple tortfeasors often discuss the legal doctrine of “concurrent causes,” in which more than one tortfeasor contributed to the plaintiff’s injury. The literature examines several cases that illustrate the problems that multiple tortfeasors may cause. An interesting example of concurring causes involves two factories that discharge poisonous wastewater into a river and, as result, fish in the river die.¹³ The wastewater of each factory separately was sufficient to kill the fish.¹⁴ This is a typical situation that could arise in not only domestic but also transboundary pollution cases. Consider an instance where two upstream countries contribute

11. The preventive effect of liability rules was explicitly stressed in the EU White Paper on Environmental Liability, which preceded the European Environmental Liability Directive. EUROPEAN COMM’N, WHITE PAPER ON ENVIRONMENTAL LIABILITY 5 (2000). See also *Deterrence, Insurability and Compensation in Environmental Liability. Future Developments in the European Union*, in 5 TORT AND INSURANCE LAW (Michael Faure ed., 2003) for a commentary on the White Paper on Environmental Liability.

12. For an overview of empirical evidence concerning the effects of liability rules see generally DON N. DEWEES ET AL., EXPLORING THE DOMAIN OF ACCIDENT LAW: TAKING THE FACTS SERIOUSLY (1996); Benjamin Van Velthoven, *Empirics of Tort*, in 1 TORT LAW AND ECONOMICS 453, 453–98 (Michael Faure ed., 2d ed. 2009). For an overview of empirical evidence with respect to the deterrent effect of environmental liability rules, see Michael G. Faure, *Designing Incentives Regulation for the Environment*, in GLOBAL ENVIRONMENTAL COMMONS. ANALYTICAL AND POLITICAL CHALLENGES IN BUILDING GOVERNANCE MECHANISMS 275–307 (2012).

13. Another example would be a case where two cars are racing down a street and one of them hits a pedestrian. This is a case where the defendants have, in fact, acted together to cause the victims harm. See ROBERT COOTER & THOMAS ULEN, LAW AND ECONOMICS 383 (5th ed. 2008).

14. The example comes from UNIFICATION OF TORT LAW: CAUSATION 6 (Jaap Spier ed., 2000).

by emitting polluting substances that cause harmful consequences in another state downstream. Interestingly, in this particular case, all jurisdictions unanimously hold that the tortfeasors should be jointly and severally liable.¹⁵

A second classic example, in which there are multiple possible rather than actual tortious causes, is the situation in which two or more hunters negligently try to bring down a bird.¹⁶ Instead, one of the hunters shoots the victim.¹⁷ However, it is unknown who fired the injurious shot.¹⁸ This is usually referred to as a case of “alternative causation”—in the sense that each of the three hunters could be the cause of the accident.¹⁹ This example, unlike the situations involving clear concurrent causation, introduces causal uncertainty, and the unanimity between the legal systems disappears. One comparative analysis states that, although there are significant differences among the provided legal rationales, in the end, the victim will still have the possibility to claim compensation from any of the hunters involved.²⁰ The overview provided by the European Group on Tort Law states that most legal systems would impose joint and several liability on all of the hunters, although some jurisdictions doubt this approach.²¹

B. Basic Approach and Justifications

There is essentially unanimity across civil and common law jurisdictions on treatment of cases in which various tortfeasors have knowingly acted in concert to produce the plaintiff’s injury: they will be jointly and severally liable. However, if they are acting independently of one another, things are more complicated.²² In those cases, almost all jurisdictions adopt a rule of joint and several liability if it can be proven that each defendant contributed to the entirety of the plaintiff’s injury, and most jurisdictions also do so if it can be proven that each defendant contributed to at least part

15. See Jaap Spier & Olav A. Haazen, *Comparative Conclusions on Causation*, in UNIFICATION OF TORT LAW: CAUSATION, *supra* note 14, at 146–47.

16. See EUROPEAN GROUP ON TORT LAW, PRINCIPLES OF EUROPEAN TORT LAW: TEXT AND COMMENTARY 48–49 (2005).

17. *Id.*

18. See UNIFICATION OF TORT LAW: CAUSATION, *supra* note 14, at 6.

19. Cooter and Ulen refer to this as an example of indivisible harm. See COOTER & ULEN, *supra* note 13, at 383.

20. But under French law it would be based on a liability *in solidum*, whereas under English law the burden of proving lack of causation would be shifted to the defendant. See WALTER VAN GERVEN ET AL., CASES, MATERIALS AND TEXTS ON NATIONAL, SUPRANATIONAL AND INTERNATIONAL TORT LAW 465 (2000); see also CEES VAN DAM, EUROPEAN TORT LAW 286–90 (2006).

21. More particularly in Italy and in South Africa. See Spier & Haazen, *supra* note 15, at 154.

22. EUROPEAN GROUP ON TORT LAW, *supra* note 16, at 45.

of the plaintiff's injury and it is impossible to prove who caused which portions of the plaintiff's injury.²³ The effect is that the victim can choose to sue any of the injurers (who fall within the joint and several liability regime) and claim full compensation from any of them.²⁴ The injurer who had to fully compensate the victim can then in turn reclaim from the other tortfeasors in proportion to their comparative responsibility for the loss based on relative causal contribution and fault.²⁵ The plaintiff is not allowed to recover more than full compensation (meaning more than 100% of the value of the harm).²⁶

However, due to recent "tort reform" legislation, many states in the United States now take a quite different approach. Joint and several liability of multiple tortfeasors (with a right of contribution among the tortfeasors) still exists in all cases in some states and in some cases in every state, especially for cases involving intentional torts, concerted action, or environmental harms.²⁷ But in most states multiple contributors to the same injury are now only held liable, especially for nonpecuniary harm, under widely varying rules for a fraction of the injury to which they tortiously contributed based on their comparative responsibility.²⁸

This domain of tort law seems to be in full evolution since the European Group on Tort Law drafted several volumes on multiple tortfeasors,²⁹ causation,³⁰ and the *Principles of European Tort Law*.³¹ These publications provide the European Group's ideas of what is or should be a common core of European tort law. More particularly, the *Principles of European Tort Law* represent, according to its drafters, a common denominator among various European legal systems. For that reason, it is interesting to pay attention to those principles.

Causation and apportionment between multiple tortfeasors are highly debated issues, and are discussed both in legal doctrine and in the case law of different legal systems. Given the goal of this article, it would be too daunting to discuss this in significant detail. Therefore, this article will sketch the broad outlines of the conditions under which joint and several

23. *See id.* at 142.

24. *See id.*

25. *See* EUROPEAN GROUP ON TORT LAW, *supra* note 16, at 145–46.

26. *See* COOTER & ULEN, *supra* note 13, at 384.

27. *See* Michael D. Green, *Multiple Tortfeasors Under U.S. Law*, in UNIFICATION OF TORT LAW: MULTIPLE TORTFEASORS 261, 261–62 (W.V.H. Rogers ed., 2004).

28. *Id.* For a comparative overview see W.V. Horton Rogers, *Comparative Report on Multiple Tortfeasors*, in UNIFICATION OF TORT LAW: MULTIPLE TORTFEASOR, *supra* note 27, at 272–73.

29. Rogers, *supra* note 28, at 274.

30. *See* UNIFICATION OF TORT LAW: CAUSATION, *supra* note 14.

31. *See* EUROPEAN GROUP ON TORT LAW, *supra* note 16.

liability applies under domestic tort law. Moreover, this article will briefly examine the justifications that are provided in European legal doctrine for joint and several liability.

There are a number of pragmatic and theoretical justifications provided in European legal doctrine. One is that all defendants are, by hypothesis, wrongdoers and that the risk of insolvency and other practical limits to recovery should fall on them rather than on the victim.³² In addition, W.V. Rogers, in an essay titled *Comparative Report on Multiple Tortfeasors*, points to the fact that defendants may often be insured and that the insurer may have set premiums on the basis that its insured will be solely responsible for the damage.³³ Finally, joint and several liability is also defended on the basis of equity and the need to guarantee the protection of victims.³⁴ However, Rogers holds that this justification for joint and several liability may be weaker when the defendant is held liable under a strict liability theory. After all, under strict liability, the defendant is not necessarily a “wrongdoer.”³⁵ Joint and several liability also becomes more complicated when the victim is at fault as well.³⁶ This article will now address how multiple tortfeasors are dealt with in the *Principles of European Tort Law* and on which basis contribution is possible between joint tortfeasors.

C. Principles of European Tort Law

It is worth discussing how the *Principles of European Tort Law* (the “*Principles*”) deals with some of the cases discussed above since it provides different answers for the case of concurring causes and other instances involving multiple tortfeasors.

In the case of concurring causes, Article 3:102 of the *Principles* states that where each tortfeasor alone could have caused the damage at the same time, each activity is considered a cause of the victim’s damage.³⁷ The commentary provides an interesting example: defendant 1 launches a long-distance missile and defendant 2 a short-distance one. Both missiles hit the victim’s premises at the same time. The launching did not take place at the

32. Rogers, *supra* note 28, at 274.

33. *Id.* (Whether these insurability arguments make sense from an economic perspective will be further discussed *infra* in Section IV, Part D).

34. *Id.* at 275.

35. *Id.*

36. Also Van Gerven et al. holds that an exception to the principle of joint and several liability exists where the victim was also at fault in which case the liability of the defendant will be directly reduced to take into account the fault of the plaintiff. See VAN GERVEN ET AL., *supra* note 20, at 464–65.

37. EUROPEAN GROUP ON TORT LAW, *supra* note 16, at 44.

same time; however, the missiles hit the target concurrently. The fact that the damage is caused at the same time is decisive. Since each activity could have caused the entire loss, even in the absence of the other, the persons liable for the respective activities are liable in full.³⁸ This is a case where two or more events are *conditiones sine quibus non*³⁹ for the loss. In this example, the European Group opts for solidary liability.⁴⁰ Hence, the articles of the *Principles* on concurrent causes also refer to the articles on solidary liability.⁴¹ However, a different solution is stated in the case of causal uncertainty. This occurs where two or more causes may or may not have caused a loss.⁴² There is uncertainty about whether or not the respective events do fulfill the *conditio sine qua non* requirement.⁴³ In this second example, the European Group opts for proportional liability. This is clear from Article 3:103 of the *Principles*, referred to as alternative causes.⁴⁴ There are concurrent causes in the example of two companies emitting wastewater causing harm to a state downstream, and hence solidary liability would apply according to Article 3:102. However, in the case of the three hunters where there is causal uncertainty, the *Principles* would apply proportional liability, meaning that each of the hunters will be liable for one-third of the loss.⁴⁵

Chapter 9 of the *Principles* enumerates the conditions of solidary liability, which correspond largely with the situations mentioned above in which almost all or many jurisdictions adopt joint and several liability. According to Article 9:101, liability is solidary where:

- a. a person knowingly participates in or instigates or encourages wrongdoing by others which causes damage to the victim; or
- b. one person's independent behavior or activity causes damage to the victim and the same damage is also attributable to another person.

38. *Id.* at 45.

39. The Latin phrase that a particular event should be *conditio sine qua non* of the loss indicates that without the event the loss would not have occurred. In the English language this is sometimes described as "but for" the event the victim's loss would not have occurred.

40. Joint and several liability is referred to as solidary liability by the European Group on Tort Law.

41. See EUROPEAN GROUP ON TORT LAW, *supra* note 16, at 47.

42. *Id.* at 48.

43. *Id.*

44. Art. 3:103(1) reads, "In case of multiple activities, where each of them alone would have been sufficient to cause the damage, but it remains uncertain which one in fact caused it, each activity is regarded as a cause to the extent corresponding to the likelihood that it may have caused the victim's damage." *Id.* at 47.

45. *Id.* at 48-49.

c. a person is responsible for damage caused by an auxiliary in circumstances where the auxiliary is also liable.⁴⁶

Article 9:101(2) explains what the consequences of solidary liability are: “The victim may claim full compensation from any one or more of them, provided that the victim may not recover more than the full amount of the damage suffered by him.”⁴⁷

The *Principles* only make an exception to solidary liability for the case where damage caused by each tortfeasor would not be “the same damage.”⁴⁸ Article 9:101(3) holds that the damage attributed to each tortfeasor is the same when there is no reasonable basis for attributing only part of it to each of the persons liable to the victim.⁴⁹ The party asserting that damages are not the same has the burden of proving this.⁵⁰ If that burden is satisfied, liability will be several, meaning that each person is liable to the victim only for the part of the damage attributable to him.

Summarizing this discussion, the common core of European domestic tort law systems shows that joint and several liability is accepted in specific cases where tortfeasors have acted together to cause one, indivisible harm.⁵¹ However, due to “tort reform,” U.S. law evinces a much more diversified picture. Moreover, the unanimity among European jurisdictions disappears when causal uncertainty is introduced (as in the three hunters case).

D. Contributions Between Tortfeasors

The treatment of concurrent liability so far deals with the “external” aspect, that is, the relationship between the various tortfeasors and the victim. However, another related (and obvious) question arises: how does one deal with recourse between the tortfeasors, sometimes referred to as the “internal” aspect?⁵² Legal systems differ on the basis for recovery. The question centers on the basis on which one tortfeasor, who has fully compensated the victim, can recover from the other tortfeasors. Some legal systems base this on an independent right of recourse; others hold that the tortfeasor who paid the victim is able to exercise the rights of the victim (this is referred to as subrogation); others even call on the law of unjust

46. *Id.* at 142.

47. *Id.*

48. *Id.*

49. *Id.*

50. Art. 9:101(3) of the *Principles of European Tort Law* states: “For this purpose it is for the person asserting that the damage is not the same to show that it is not.” *Id.*

51. *See id.* at 143–45.

52. Rogers, *supra* note 28, at 292.

enrichment.⁵³ In some legal systems, specific provisions exclude or restrict the recourse action. For example, in the United States, a recourse action is not available for an intentional wrongdoer.⁵⁴

In principle, the amount of recourse should correspond to the relative causal contribution or comparative responsibility (based on relative fault as well as causal contribution) if it differs between the tortfeasors. Suppose that the full loss of the victim was \$3,000 and that tortfeasor 1's relative causal contribution or comparative responsibility was 20% while tortfeasor 2's was 80%. The victim claims compensation in full from tortfeasor 2, who thereby compensates the victim with \$3,000. In this example, tortfeasor 2 can only claim recourse for 20% of \$3,000 (a total of \$600) from tortfeasor 1.⁵⁵ This is the solution in the United States,⁵⁶ and it seems to be the solution in most legal systems.⁵⁷ The same solution follows if there is a risk of insolvency by one of the contributors. The failure of a solidary debtor to fulfill his obligation (because of insolvency) is substituted by his co-debtors, pro rata to the amount of debt owed by each of them.⁵⁸ Under this system, the internal liability (contribution via recourse) is based on the comparative responsibility of each contributor. That comparative responsibility will also determine each tortfeasor's contribution in case one of them is insolvent.

Article 9:102 of the *Principles* also deals with the internal aspect, i.e. the obligation to contribute to other tortfeasors. Article 9:102(4) holds that "the obligation to make the contribution is several".⁵⁹ That means that the person subject to contribution is only liable for his apportioned share of comparative responsibility. If it is not possible to enforce a judgment of contribution against one tortfeasor (e.g. in a case of insolvency), that share is to be reallocated among the other persons liable in proportion to their comparative responsibility.⁶⁰ This rule corresponds with the common core of European domestic tort law systems as explained above.

53. *Id.*

54. See Green, *supra* note 27, at 264.

55. Rogers, *supra* note 28, at 299.

56. Green, *supra* note 27, at 263–64.

57. *Id.*

58. Rogers, *supra* note 28, at 300.

59. EUROPEAN GROUP ON TORT LAW, *supra* note 16, at 142.

60. *Id.* at 145–46.

IV. MULTIPLE TORTFEASORS IN LAW AND ECONOMICS

At first blush, a joint and several liability rule appears to deviate from the principle that a tortfeasor should only be held liable for the damage caused by his own behavior. However, as discussed above, under joint and several liability each tortfeasor is only held liable for damages that it caused. The fact that others also contributed to the same injury provides an equitable basis for contribution claims among the multiple contributors to the injury but does not lessen any tortfeasor's status as a cause of (contributor to) the entirety of the injury.

One could, therefore, from an economic perspective, argue that a joint and several liability system is inefficient since it leads to over-deterrence; the injurer's liability is not limited to the risk created by its own activity. However, such a simple conclusion is, indeed, too simple. One may argue that a distinction should be made between the situation of full solvency of all the contributing tortfeasors on the one hand and the situation in which either one or more of them are insolvent.⁶¹

Given this difference, the following section first discusses how the basic model assumes that all tortfeasors are fully solvent. It then explains the difference between the strict liability and negligence rules. Lastly, this section examines the situation of insolvency and how insurability may be affected by differing regimes.

A. Full Solvency: Basic Model

In the case where all actors are fully solvent, one can argue that there is no efficiency loss caused by joint and several liability.⁶² The injurer who has to compensate the victim can, in turn, exercise a redress against the other parties who contributed to the loss in proportion to their contribution.⁶³ From an economic perspective, it is important to charge each tort-

61. See Pierre Widmer, *Causation Under Swiss Law*, in UNIFICATION OF TORT LAW: CAUSATION, *supra* note 14, at 112–13 (noting that joint and several liability amounts to a shifting of the risk of insolvency to the joint tortfeasors).

62. See Lewis Kornhauser & Richard Revesz, *Sharing Damages Among Multiple Tortfeasors*, 98 YALE L.J. 831, 831–84 (1989) for a detailed analysis of joint and several liability when all defendants are fully solvent, and Lewis Kornhauser & Richard Revesz, *Apportioning Damages Among Potentially Insolvent Actors*, 19 J. LEGAL STUD. 617, 617–51 (1990) for analysis in case of limited solvency. See also Lewis Kornhauser & Richard Revesz, *Joint Tortfeasors*, in 2 ENCYCLOPEDIA OF LAW AND ECONOMICS, CIVIL LAW AND ECONOMICS 625, 625–43 (Boudewijn Bouckaert & Gerrit De Geest eds., 2000); Lewis Kornhauser & Richard Revesz, *Joint and Several Liability*, in THE NEW PALGRAVE DICTIONARY OF ECONOMICS & THE LAW 371, 371–76 (Peter Newman ed., 1998).

63. See William M. Landes & Richard A. Posner, *Joint and Multiple Tortfeasors: An Economic Analysis*, 9 J. LEGAL STUD. 517, 524 (1980); SHAVELL, ECONOMIC ANALYSIS, *supra* note 4, at 164–65.

feasor precisely the amount that he has contributed to the risk in order to provide efficient incentives for prevention to all contributing actors.

Moreover, the advantage of a joint and several liability rule is that it may provide incentives for mutual monitoring between tortfeasors.⁶⁴ Since the risk that one liable operator would have to contribute would also depend on the likelihood that others commit torts, joint and several liability would give incentives to operators to mutually monitor the care levels exercised and could thus add to prevention. However, obvious questions arise: to what extent do operators have possibilities for such a mutual monitoring and will they actually have possibilities to do so? For example, in a relatively small-scale pollution case, where various actors contribute to a landfill, this *ex ante* mutual monitoring may be possible. But in other, large-scale cases involving many potential tortfeasors, the administrative costs of such a mutual monitoring may be prohibitive.

Joint and several liability also has an advantage because it provides incentives to the victim to sue. In a case of several liability, which would require the victim to sue every tortfeasor separately, the costs for bringing the suit may be prohibitive. Given the rational apathy and cost aversion of tort victims,⁶⁵ requiring a victim to sue each contributing tortfeasor separately will increase barriers to justice. It also increases the likelihood that tortfeasors will not be confronted with the social cost of their activity. Joint and several liability reduces cost for the victims and therefore increases the likelihood that tortfeasors are confronted with the externalities they cause.⁶⁶

Assuming that the other tortfeasors are fully solvent, the effect of joint and several liability is that the one who first paid only pre-finances the compensation of the victim and will be able to recover a part of the damage paid.⁶⁷ Thus, in the end, under joint and several liability, the extent to which every contributor has to pay should be proportionate to his contribution. For this economic approach to tort law to work, it is essential that the tortfeasor is proportionally exposed to the accident costs to the extent that he contributed to the risk.⁶⁸ In that sense, a joint and several liability rule, combined with a right of recourse and solvent actors, amounts to a propor-

64. This argument is especially made in Tom H. Tietenberg, *Indivisible Toxic Torts: The Economics of Joint and Several Liability*, 65 LAND ECON. 305, 315 (1989).

65. See Hans-Bernd Schäfer, *The Bundling of Similar Interests on Litigation. The Incentives for Class Actions and Legal Actions taken by Associations*, 9 EUR. J. L. & ECON. 183 (2000).

66. COOTER & ULEN, *supra* note 13, at 384.

67. See Landes & Posner, *supra* note 63, at 530.

68. See Robert Young et al., *Causality and Causation in Tort Law*, 24 INT'L REV. L. & ECON. 507, 518–20 (2004), and Robert Young et al., *Multiple Tortfeasors: An Economic Analysis*, in 3 REV. L. & ECON. 111, 111–32 (2007) for a more detailed analysis of different factual circumstances.

tionate solution. The exposure to liability of every tortfeasor in this model is limited to its own contribution to the loss. Thus, optimal incentives will follow, at least under a negligence regime.⁶⁹

One could also question whether joint and several liability leads to lower or higher administrative costs than the alternative of just several liability. At first glance, there is no major difference between both rules. In the case of solidary liability, the victim only has to bring one lawsuit against the defendant of his choice, which lowers administrative costs. However, since the one tortfeasor who is sued by the victim will subsequently exercise recourse, those subsequent recourse actions will also lead to litigation costs. In the case of several liability, the victim has to bring a lawsuit against all responsible tortfeasors, which could lead to higher administrative costs. It can be argued that the costs of the actions in recourse by the defendant (for example, a corporate defendant) may be lower than the victim's cost to sue all primary tortfeasors since recourse should not necessarily take place via litigation. Rather, it could result from settlements between the various defendants who are liable on a solidary basis. If there were reasons to believe that recourse actions could be exercised at lower costs than the victim's litigated case, solidary liability may lead to lower administrative costs.

Robert Cooter and Ariel Porat, in their article titled *Total Liability for Excessive Harm*, proposed one original solution: hold all contributing tortfeasors liable for only all of the excessive harm that every tortfeasor causes.⁷⁰ With excessive harm, Cooter and Porat refer to the difference between the total harm caused by all injurers and the optimal total harm.⁷¹ This rule of total liability for excessive harm creates, they argue, incentives for efficient precaution and activity level.⁷² Actual harm will not be excessive and as a result, actual liability will be nil.⁷³ However, this rule of total liability for excessive harm only has practical advantages if: (1) total harm is verifiable, (2) optimal harm is calculable, and (3) the number of injurers is not too large.⁷⁴

69. Louis T. Visscher, *Tort Damages*, in 1 TORT LAW AND ECONOMICS, *supra* note 12, at 153, 179.

70. Robert Cooter & Ariel Porat, *Total Liability for Excessive Harm*, 36 J. LEGAL STUD. 63, 64 (2007).

71. *Id.*

72. *Id.* at 68.

73. *Id.* at 64, 78.

74. *Id.* at 64. See also Visscher, *supra* note 69, at 179–80, for a summary.

B. *Strict Liability Versus Negligence*

As far as the efficiency of joint and several liability is concerned, literature distinguishes between the situations of strict liability and negligence. Under strict liability with contribution between tortfeasors, a tortfeasor is only exposed to part of the accident costs. The tortfeasor is no longer responsible for the full accident costs, causing possible inefficiency.⁷⁵ This problem could be solved by having no contribution between the tortfeasors and allowing full recovery by the victim against all contributing tortfeasors. This would have the benefit of exposing all tortfeasors to the full costs of their activity, but it obviously has the disadvantage of potentially frivolous law suits on behalf of victims.⁷⁶ The same problems do not arise in negligence cases, as long as the due care required in the relevant legal system is equal to the optimal care to internalize the externality.⁷⁷

Turning to the question of contribution, the legal basis for such a contribution may, from an economic perspective, either be a strict liability rule or a negligence rule.⁷⁸ Generally, strict liability is preferred where a unilateral act is concerned (i.e. where only the tortfeasor influenced the harm and the victim could not reduce the accident risk) or where an ultra-hazardous activity is involved.⁷⁹ Both strict liability and negligence can provide potential tortfeasors with incentives to take efficient care, but in such a unilateral ultra-hazardous situation, strict liability has the advantage of providing injurers equally with incentives to adopt an efficient activity level.⁸⁰ For example, in a product liability case, this would refer to the number of products produced. In a traffic accident, it would refer to the number of miles driven.⁸¹ Strict liability has the advantage of providing both incentives to adopt efficient care as well as an efficient activity level to the potential injurer.⁸² The contributing actors on whom recourse is exercised will be equally exposed to appropriate incentives via either a strict liability or a

75. COOTER & ULEN, *supra* note 13, at 384; Visscher, *supra* note 69, at 178.

76. COOTER & ULEN, *supra* note 13, at 385.

77. Visscher, *supra* note 69, at 179.

78. See Shavell, *Strict Liability Versus Negligence*, *supra* note 4, at 1–25, for the difference between both systems and the conditions under which strict liability is preferred over negligence and Hans-Bernd Schäfer & Frank Müller-Langer, *Strict Liability Versus Negligence*, in 1 TORT LAW & ECONOMICS, ENCYCLOPEDIA OF LAW AND ECONOMICS 3, 3–45 (Michael Faure ed., 2d ed. 2009), for a recent summary.

79. See Schäfer & Müller-Langer, *supra* note 81, at 21 (stating that strict liability only implies that there should be no fault or negligence as a basis for the recourse, but obviously not that the (strictly liable) tortfeasor would (in the internal relationship) have to pay more than his own share).

80. The activity level refers to the number of times that the injurer engages in the activity.

81. See Peter A. Diamond, *Single Activity Accidents*, 107 J. LEGAL STUD. 107, 109 (1974).

82. See William M. Landes & Richard A. Posner, *The Positive Economic Theory of Tort Law*, 15 GA. L. REV. 851, 875 (1981).

negligence rule. Recall, however, that under strict liability the problem of under-deterrence could arise since not all contributing tortfeasors are exposed to the full costs of their activity.⁸³

C. Insolvency

The analysis presented above may not be valid under insolvency.⁸⁴ The same problems arise as under strict liability, discussed *supra*, when insolvent tortfeasors are involved.⁸⁵ For that matter, one can equate the situation of insolvency to any situation where a claim against particular defendants is impossible, for example, because they have disappeared or become judgment proof. Indeed, the picture changes if the other tortfeasors can no longer be sued. The risk of non-recovery from other tortfeasors is *de facto* shifted to the one injurer who will be sued by the victim. If in that particular case one would assume that only the solvent injurer is sued by the victim and he has no right of recourse (given the insolvency of the others), the effect would be that one (solvent) injurer would be held to compensate for losses which he has not caused.⁸⁶ In cases involving insolvency or the general impossibility of recovery from any of the other tortfeasors, joint and several liability may violate the principle that the injurer should only be held liable to compensate in the proportion to which he contributed to the loss.⁸⁷

The problem with insolvency is that joint and several liability may not lead to more care by the remaining (solvent) injurers. However, there may be an effect on activity level. The activity level may be reduced, or eliminated altogether, because liability costs for damages caused by other tortfeasors would be crippling; thus reducing the incentives of particular operators to engage in certain activities that are considered socially desira-

83. See Lewis A. Kornhauser & Richard L. Revesz, *Joint and Several Liability*, in 1 TORT LAW AND ECONOMICS, *supra* note 12, at 122.

84. See James Boyd & Daniel Ingberman, *The Vertical Extension of Environmental Liability through Claims of Ownership, Contact & Supply*, in THE LAW & ECONOMICS OF THE ENVIRONMENT 44, 44–65 (Anthony Heyes ed., 2001) for an excellent analysis of the effects of various systems of extended liability and the assertion that under certain conditions extended liability may promote cost internalization, but that there are serious drawbacks as well. Hence, they argue that other solutions should be examined to cure the problem of undercapitalization.

85. See Visscher, *supra* note 69, at 179.

86. Joint and several liability would then lead to over-deterrence. See BERGKAMP, *supra* note 9, at 301.

87. See Lucas Bergkamp, *The Proper Scope of Joint and Several Liability*, TIJDSCHRIFT VOOR MILIEUSCHADE EN AANSPRAKELIJKHEIDRECHT 154, 154–55 (2000) for an argument that joint and several liability may be unfair and may lead to over-deterrence.

ble.⁸⁸ In this instance, joint and several liability may amount to over-deterrence.

Over-deterrence is a strong argument against joint and several liability in the case of potentially insolvent injurers. However, whether the legislature introduces several (or proportional) liability in order to avoid a crippling liability on operators is ultimately a policy choice since it obviously has important distributional consequences. Legislators will have to decide whether the insolvency risk will lay with potential victims or with operators. Solidary liability shifts the insolvency risk to operators, with the potential danger of a crushing liability and a reduced activity level below socially desirable levels. However, the alternative of several (proportional) liability forces the victim to sue all tortfeasors who contributed to the risk. If one of those tortfeasors is insolvent, the insolvency risk then remains with the victim. Whether the risk of injurer insolvency should remain with operators or with victims cannot be answered solely on economic grounds, since it may have important distributional consequences as well. It is precisely because of those distributional consequences that many legislatures have introduced solidary liability, thus shifting insolvency risks from operators to victims.

D. Insurability

Within the domestic tort context, there is yet another dimension which is often added to the debate: joint and several liability is often considered an expansion of traditional tort liability.⁸⁹ Such an expansion of liability is, according to some scholars, dangerous since it could endanger the insurability of liability risks.⁹⁰ This fits into the idea that domestic tort liability should remain within limits of insurability because stretching the boundaries of tort liability could potentially lead to an insurance crisis.⁹¹ Within that context, a question has been asked: what is the effect of joint and several liability in domestic tort law on the insurability of liability risks? From an insurance perspective, some have warned against joint and several liabil-

88. See SHAVELL, *ECONOMIC ANALYSIS*, *supra* note 4, at 164 for further information on the crushing effect of joint and several liability; see Bergkamp, *supra* note 87, at 153–55.

89. See, *inter alia*, Michael J. Trebilcock, *The Social Insurance-Deterrence Dilemma of Modern North American Tort Law: A Canadian Perspective on the Liability Insurance Crisis*, 24 SAN DIEGO L. REV. 929, 959 (1987).

90. See Kenneth S. Abraham, *Environmental Liability and the Limits of Insurance*, 88 COLUM. L. REV. 942, 942–88 (1988); Martin T. Katzman, *Pollution Liability Insurance and Catastrophic Environmental Risks*, J. RISK & INS. 75, 75–100 (1988).

91. This argument has especially been strongly defended by George L. Priest, *The Current Insurance Crisis and Modern Tort Law*, YALE L. J. 1521, 1521–90 (1987).

ity because the insurer is no longer merely insuring the risk created by his insured individual (which he can still control), but also the risk caused by all others.⁹² Joint and several liability then amounts to a system where insurers can no longer accurately calculate premiums⁹³ and may have difficulties in correctly calculating the amount of reserves to be set aside.⁹⁴ This problem especially arises in the case where no recourse is possible because other contributing tortfeasors cannot be found or are insolvent and therefore judgment proof. One important condition for insurability is that the insurer needs to be able to predict the risk (i.e. the probability that an accident may occur multiplied with the damage caused by his insured).⁹⁵ Under joint and several liability with insolvency of contributing partners, there is a risk that insurers may not only cover the damage caused by their insured, but de facto cover the entire market.⁹⁶ Since, under joint and several liability, insurers may not know whether their insured will be able to exercise recourse (in which case his liability exposure may effectively be limited to the extent that he contributed to the risk), civil liability under joint and several liability becomes unpredictable and hence uninsurable.⁹⁷

Although this argument about uninsurability of joint and several liability is repeated often in the literature,⁹⁸ from a purely theoretical perspective, it is not so clear why solidary liability would be uninsurable. Theoretically, for example, if all companies in the market are exposed to solidary liability and both tortfeasors and insurance companies are aware of this, this could lead to a higher probability that the insurance company of one operator will have to compensate not only for the damage caused by its insured, but also for damage caused by other insureds. However, the same risk would not only exist for that one operator, but presumably for all oth-

92. See Herman Cousy, *Recent Developments in Environmental Insurance*, in RECENT ECONOMIC AND LEGAL DEVELOPMENTS IN EUROPEAN ENVIRONMENTAL POLICY 235, 235–37 (Filip Abraham et al. eds., 1995).

93. Since they are no longer merely insuring the risk caused by their insured, but potentially by others as well.

94. MICHAEL FAURE & TON HARTLIEF, *INSURANCE AND EXPANDING SYSTEMIC RISKS* 127 (2003).

95. See Omri Ben-Shahar & Kyle D. Logue, *Outsourcing Regulation: How Insurance Reduces Moral Hazard*, 111 MICH. L. REV. 197, 197–248 (2012).

96. See J. Han Wansink, *Het DES-arrest in het perspectief van verzekerbare slachtofferbescherming*, AANSPRAKELIJKHEID EN VERZEKERING 7–12 (1993) for a point made by the Dutch insurance expert Wansink who held that joint and several liability leads to an insurer de facto covering the liability insurance for the entire market, which according to him amounts to uninsurability of the risks.

97. See, *inter alia*, Bergkamp, *supra* note 87, at 154.

98. See, *inter alia*, FAURE & HARTLIEF, *supra* note 94, at 126–27; Michael Faure, *Causal Uncertainty, Joint and Several Liability and Insurance*, in LIBER AMICORUM PIERRE WIDMER 79, 79–98 (Helmut Koziol & Jaap Spier eds., 2003).

ers as well. In other words, there is, on the one hand, a probability of the insurer having to cover damage not caused by its insured, but there is an equal likelihood that the insured will not be bound to compensate even though he caused (part of the) damage. Theoretically, those probabilities could cancel each other out and, as a result, the total risk exposure for corporate defendants and their insurers should not necessarily increase. From a practical perspective, however, it may be extremely difficult for an insurer to calculate *ex ante* probabilities necessary to fix actuarially fair premiums. The insurer would not only have to take into account the risk caused by its own insured, but also the likelihood that either the insured would have to pay for losses caused by others or that others would cover part of the losses caused by its insured. From a pragmatic perspective, it could therefore be held that joint and several liability may increase the *ex ante* administrative costs for insurers to calculate probability and therefore also increase actuarially fair premiums.

E. Summary

The economic approach to tort law distinguishes two situations as far as joint and several liability is concerned. The first situation assumes that all tortfeasors can be identified, can be sued in a recourse action, and are solvent. Joint and several liability in that particular case creates no problem—at least in the context of the negligence rule:

- The fact that the victim only brings one suit could reduce administrative costs, if the costs of recourse actions between defendants were lower than the costs for the victim to sue all liable injurers;
- Joint and several liability can provide incentives for mutual monitoring;
- Via the recourse action, an attribution among the different tortfeasors is possible on the basis of their own contribution to the risk; and
- A correct allocation of risk is possible and optimal incentives for deterrence are provided.

The second situation—in which an economic perspective on joint and several liability is far more problematic—involves either a strict liability rule, an insolvency risk, or potential tortfeasors that could not be identified (and hence against whom no recourse would be possible). That case creates problems:

- Joint and several liability may not lead to a correct allocation of social costs;

- It leads potentially to over-deterrence of the one tortfeasor who is sued; it may potentially lead to a so-called crushing liability;
- It may equally lead to insurability problems; and
- A proportional liability rule would, in that case, be preferred.

V. CHANNELING OF LIABILITY

We now turn to a situation, which in a way is the mirror image of solidary liability, in that there is the exclusive legal channeling of liability to one responsible tortfeasor. First, a few examples are provided. Next, the main reasons and justifications are explained and the recourse between different parties is discussed. An analysis of channeling from an economic perspective follows as well as a discussion of insurability aspects.

A. Examples

Another feature can be found in some liability statutes, mostly because of international conventions, where a deviation from the principle that only the injurer who caused the damage should be held fully liable for the loss.⁹⁹ This concerns the so-called channeling of liability. Whereas with joint and several liability a victim can in principle claim full compensation from any of the multiple injurers, channeling is the reverse. Under channeling, the liability is attached to one party who becomes fully liable for the damage.¹⁰⁰ Channeling is often exclusive. Channeling statutes indicate which (of many possible) parties can be held liable for the loss.¹⁰¹ The result is that the victim can only sue the “channeled” injurer and not another party who might have contributed to the loss.

As already indicated above, channeling of liability can be found in international conventions with respect to nuclear liability and marine pollution.¹⁰² For example, under the *Paris Convention on Nuclear Liability*, liability is channeled to operators.¹⁰³ According to the *Convention*, no one

99. HUI WANG, CIVIL LIABILITY FOR MARINE OIL POLLUTION DAMAGE: A COMPARATIVE AND ECONOMIC STUDY OF THE INTERNATIONAL, U.S. & CHINESE COMPENSATION REGIME 82 (2011) (“It is a deviation from the general principle of tort law that the tortfeasor who caused damage should be held liable.”).

100. See *id.* at 82–83 for a discussion of channeling in the nuclear industry and in cases of oil pollution.

101. See *id.* at 82 (“It means that only the statutory channeled party shall be exclusively liable for the damage and the other parties are excluded from the liability.”).

102. See JING LIU, COMPENSATION FOR ECOLOGICAL DAMAGE: COMPARATIVE AND ECONOMIC OBSERVATIONS 212 (2013) and PHILIPPE SANDS ET AL., PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW 738–45 (3d ed. 2012) for a discussion of channelling under the nuclear liability conventions.

103. See LIU, *supra* note 102, at 212; SANDS ET AL., *supra* note 102, at 739.

is liable for the damage caused by a nuclear accident but the operator.¹⁰⁴ The “operator” is defined as “the person designated or recognised by the competent public authority as the operator of that installation.”¹⁰⁵ The *Paris Convention* is the only legal basis for a claim against the nuclear operator in case of an incident.¹⁰⁶ Additionally, the *Convention on the Liability of Operators of Nuclear Ships of Brussels*¹⁰⁷ held that “except as otherwise provided in this Convention no person other than the operator shall be liable for such nuclear damage.”¹⁰⁸ The 1969 *International Convention on Civil Liability for Oil Pollution Damage* (“1969 CLC”) created a channeling of liability for oil pollution damage to the tanker owner.¹⁰⁹ The tanker owner is defined as “the person or persons registered as the owner of the ship or, in the absence of registration, the person or persons owning the ship.”¹¹⁰ The application of all other legislation is pre-empted; no claims are possible other than those under the *Convention*.¹¹¹ Claims against servants or agents of the owner are *explicitly* excluded.¹¹² It is debatable whether this list of persons against whom no claim is possible still allows the possibility of claims against other parties. For example, some argue that claims against a cargo owner and operator would still be possible according to applicable national laws.¹¹³ Additionally, the *Hazardous and Noxious Substances by Sea Convention* channels liability to the owner of the ship, defined as the person or persons registered as the owner of the ship or the person or persons owning the ship.¹¹⁴

104. Convention on Third Party Liability in the Field of Nuclear Energy art. VI(a), July 29, 1960, 956 U.N.T.S. 251.

105. *Id.* art. I(a)(vi).

106. *Id.* art. VI(c)(ii).

107. Convention on the Liability of Operators of Nuclear Ships, May 25, 1962, 57 AM. J. INT’L L. 268 (1963).

108. *Id.* art. II(2).

109. See LIU, *supra* note 102, at 196–99; SANDS ET. AL., *supra* note 102, at 746–47; WANG, *supra* note 99, at 87.

110. International Convention on Civil Liability for Oil Pollution Damage art. I(3), Nov. 29, 1969, 972 U.N.T.S. 3.

111. See WANG, *supra* note 99, at 87–88.

112. International Convention on Civil Liability for Oil Pollution Damage, *supra* note 110, art. III(4).

113. Albert Verheij, *Shifts in Governance: Oil Pollution*, in *SHIFTS IN COMPENSATION FOR ENVIRONMENTAL DAMAGE* 133, 141 (Michael Faure & Albert Verheij eds., 2007).

114. See International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, art. I(3), May 3, 1996, 35 I.L.M. 1415 (1996).

B. Reasons and Justifications

In the *Paris Convention on Nuclear Liability*, two formal reasons are advanced in favor of the channeling of liability: first, to avoid the complicated legal procedures to identify the liable parties and second, to allow a concentration of insurance capacity.¹¹⁵ Additionally, literature defends the channeling of liability as affording a guarantee of prompt compensation to the victim and facilitating the transfer of prevention and liability costs to the price of goods.¹¹⁶ Julio Barboza holds, “channeling of liability towards determined categories of persons is a rational way of achieving risk minimization,”¹¹⁷ and, “channeling liability affords a guarantee of prompt compensation to the victims and facilitates the transfer of prevention and liability costs to the price of goods.”¹¹⁸ However, in reality, channeling was likely not introduced to defend the interests of the victim, but rather the interests of industry. In his dissertation, Tom Vanden Borre powerfully demonstrated that channeling was introduced in the nuclear liability conventions at the request of American suppliers of nuclear fuel.¹¹⁹ The legal technique was needed to assure the American suppliers that liability suits would never be brought against them, but instead would be brought exclusively against the (European) operators of the power plants.¹²⁰

Looking at the legal history of the nuclear liability conventions, there seems to be some support for the justification provided by Vanden Borre. At the beginning of the development of the nuclear industry, the Western-European market had to rely on American suppliers and technology.¹²¹ The American nuclear industry, however, was unwilling to bear liability for possible nuclear accidents in Europe.¹²² Therefore, a “hold-harmless” clause was introduced in the first bilateral agreements between the United States and Europe, which required the European nuclear operators to indemnify the American suppliers for all claims resulting from their activi-

115. *Exposé des Motifs*, Convention on Third Party Liability in the Field of Nuclear Energy, July 29, 1960, 956 U.N.T.S. 251.

116. See, *inter alia*, JULIO BARBOZA, THE ENVIRONMENT, RISK AND LIABILITY IN INTERNATIONAL LAW 32–33 (2011).

117. *Id.* at 42.

118. *Id.* at 32–33.

119. Tom Vanden Borre, *Shifts in Governance in Compensation for Nuclear Damage. 20 Years after Chernobyl*, in *SHIFTS IN COMPENSATION FOR ENVIRONMENTAL DAMAGE*, *supra* note 113, 262, 262–66.

120. See TOM VANDEN BORRE, EFFICIËNTE PREVENTIE EN COMPENSATIE VAN CATASTROFERISICO'S: HET VOORBEELD VAN SCHADE DOOR KERNONGEVALLLEN 237–50 (2001).

121. See Vanden Borre, *supra* note 119, at 262.

122. See *id.* at 261–62.

ties.¹²³ Even with those “hold-harmless” clauses, the American industry was still unsure whether the agreements could provide sufficient protection, and the U.S. Atomic Industrial Forum conducted a comprehensive study on the possibility of European victims claiming against American suppliers in the case of a nuclear incident.¹²⁴ Two reports were published later by the Atomic Industrial Forum: the *Preliminary Report on Financial Protection Against Atomic Hazards* (“the Preliminary Report”)¹²⁵ and the *International Problems of Financial Protection Against Nuclear Risk* (“the Harvard Report”).¹²⁶ Those two reports developed principles for nuclear liability, which were later incorporated into the international conventions.

The Preliminary Report identified four parties who can be affected by nuclear risks: the nuclear industry, private insurers, the government, and the victims of a potential nuclear accident.¹²⁷ In this report, the liability of the nuclear industry is linked with insurance capacity; for the part of damage that cannot be compensated by the insurer, the government needs to provide additional compensation to protect the victims.¹²⁸ The Preliminary Report introduced a system of unlimited government intervention: any damage in excess of the limitation of liable parties’ liability should be covered by the government in terms of indemnity.¹²⁹

The channeling of liability to nuclear operators was advised in the Harvard Report.¹³⁰ According to the Harvard Report, the suppliers and contractors were exempted from liability for the following reasons: the suppliers were afraid of being held liable instead of or jointly with the operators and then being burdened by the lengthy trials; suppliers would lose control after the delivery of goods and services; and operators were more capable of obtaining insurance.¹³¹

This shows that channeling of liability to the operator was mainly an instrument to protect (American) suppliers of nuclear material. It can, therefore, largely be considered as an instrument of interest group politics,

123. Tom Vanden Borre, *Nuclear Liability: An Anachronism in EU Energy Policy?*, in EUROPEAN ENERGY LAW REPORT VII 180 (Martha M. Roggenkamp & Ulf Hammer eds., 2010).

124. Vanden Borre, *supra* note 119, at 262–63.

125. Prepared by the experts of Columbia University and published in March 1956. ARTHUR W. MURPHY, ATOMIC INDUS. FORUM, PRELIMINARY REPORT ON FINANCIAL PROTECTION AGAINST ATOMIC HAZARDS (1956).

126. Prepared by Harvard Law School and published in 1959. HARVARD LAW SCH., ATOMIC INDUS. FORUM, INTERNATIONAL PROBLEMS OF FINANCIAL PROTECTION AGAINST NUCLEAR RISK (1959).

127. Vanden Borre, *supra* note 119, at 263.

128. *Id.* at 264.

129. *Id.*

130. *Id.* at 265–66.

131. *Id.* at 261, 265–66.

rather than as an instrument either protecting the interests of victims or promoting the optimal working of accident law.

It is also interesting to mention that this channeling of liability was first introduced, as discussed *supra*, in the conventions related to nuclear liability and was later copied in other international conventions.¹³² In a historical overview concerning the development of the channeling of liability, Hui Wang, in her book titled *Civil Liability for Marine Oil Pollution Damage: A Comparative and Economic Study of the International, U.S. and Chinese Compensation Regime*, demonstrates how the existence of the channeling of liability in the nuclear industry had a strong influence on the introduction of channeling in the marine oil pollution conventions as well.¹³³

C. Recourse

There are some differences between the international conventions as far as the possibility of recourse is concerned. Under the *Paris Convention on Nuclear Liability*, the operators, in principle, do not have a right of recourse against the other parties.¹³⁴ It is argued that allowing recourse will make it necessary for suppliers to seek insurance coverage and will lead to costly duplication of insurance.¹³⁵ However, recourse is possible if the damage results from an act or omission done with intent to cause damage or, if and to the extent, provided by contract.¹³⁶ The *Vienna Convention* also has similar provisions.¹³⁷ Under the 1969 CLC, recourse against a third party is allowed.¹³⁸

D. Analysis

An argument often used to defend channeling is that it makes victims' lives much easier since they no longer have to investigate who precisely is

132. See WANG, *supra* note 99, at 82–87.

133. See *id.* at 82–88; Hui Wang, *Shifts in Governance in the International Regime of Marine Oil Pollution Compensation: A Legal History Perspective*, in *SHIFTS IN COMPENSATION FOR ENVIRONMENTAL DAMAGE*, *supra* note 113, at 224–27.

134. See LIU, *supra* note 102, at 212.

135. *Expose des Motifs*, Convention on Third Party Liability in the Field of Nuclear Energy, *supra* note 115.

136. Convention on Third Party Liability in the Field of Nuclear Energy, *supra* note 104, art. VI(f); see also LIU, *supra* note 102, at 212.

137. Vienna Convention on Civil Liability for Nuclear Damage art. X, May 21, 1963, 1063 U.N.T.S. 265.

138. International Convention on Civil Liability for Oil Pollution Damage, *supra* note 110, art. III(5).

the liable injurer (in case of an accident with multiple injurers).¹³⁹ The statute indeed simplifies the victim's life by indicating that he can only sue the injurer to which liability is channeled. Thus, one could argue that channeling leads to a reduction of transaction costs.¹⁴⁰ However, this hardly seems valid. The additional benefit of channeling for the victim is limited; the costs of discovering that it is the licensee of a nuclear power plant, for example, who may be primarily liable are not that high. Contrast this with the huge disadvantages for the victim: he no longer can possibly claim his damage from other parties who may have contributed to the loss as well. From a victim's perspective, one may well argue that joint and several liability is preferable. In that case, the victim can simply sue any of the available injurers and claim full compensation.

One possible economic explanation for the phenomenon of legal channeling is the notion of the "cheapest cost avoider." Guido Calabresi, in his book titled *The Costs of Accidents. A Legal and Economic Analysis*, held that the costs have to be allocated to the party who could reduce the costs as cheaply as possible.¹⁴¹ One could argue that the legislature identified a particular operator (like the licensee of a nuclear power plant) as the "cheapest cost avoider" and thus allocated liability to that particular person. However, the "cheapest cost avoider" was never meant to imply that if one particular party could be identified as the cheapest cost avoider, that this would necessarily exclude liability of all others who could influence the accident risk, as is the case in legal channeling of liability.

There are, indeed, substantial disadvantages to channeling of liability. Several scholars have argued that this regime of channeling is inefficient from an economic perspective, at least if one believes that an exposure to liability provides incentives for prevention.¹⁴² In particular, the fact that channeling leads to sole liability of the operator, with the exclusion of liability suits against third-party contributors, is heavily criticized.¹⁴³ Indeed,

139. See BARBOZA, *supra* note 116, at 32.

140. See VANDEN BORRE, *supra* note 120, at 698–99.

141. See CALABRESI, *supra* note 5, at 140–44.

142. With respect to the channeling for oil pollution damage, see Michael Faure & Wang Hui, *Economic Analysis of Compensation for Oil Pollution Damage*, 37 J. MAR. L. & COM. 179, 187–89 (2006). As far as channeling of nuclear liability is concerned, see Tom Vanden Borre, *Channeling of Liability: A Few Juridical and Economic Views on an Inadequate Legal Construction*, in CONTEMPORARY DEVELOPMENTS IN NUCLEAR ENERGY LAW, HARMONIZING LEGISLATION IN CEEC/NIS 13 (Nathalie Horbach ed., 1999).

143. For a critical economic analysis of the channeling of nuclear liability see Tom Vanden Borre, *Transplantatie van 'kanalisatie van aansprakelijkheid' van het kernenergie recht naar het milieu (aansprakelijkheids)recht: een goede of een gebrekkige zaak?*, in IUS COMMUNE EN MILIEURECHT, ACTUALIA IN HET MILIEURECHT IN BELGIË EN NEDERLAND 329, 329–82 (Michael Faure & Kurt Deketelaere eds., 1997) and VANDEN BORRE, *supra* note 120, at 693–701.

one can imagine situations—for instance in nuclear accident cases—where another party has contributed to the loss as well (perhaps the person who may have delivered defective nuclear material that contributed to the loss). Exclusive channeling means that the victim no longer has the right to sue another party who could have influenced the risk of accident.¹⁴⁴ The effect is, of course, that the victim's claim may not be fully satisfied. Hence, one could criticize channeling from a distributive perspective. Moreover, the third party who has contributed to the loss should be exposed to liability in order to give him incentives for prevention. If the effect of the channeling is that the third party is no longer liable, it is clearly inefficient.

Channeling may have this effect, especially in the nuclear case, since the liability of the nuclear power plant licensee (to which liability is channeled) is also limited because financial caps are introduced on the victim's compensation. Channeling requires the victim to exclusively sue the licensee of the power plant, where he is confronted with a financial cap. The victim has no opportunity to bring another lawsuit if, because of the cap, his damage was not fully compensated. A suit based on tort law against the licensee for the amount not covered by the cap is usually excluded in domestic law and a suit against a third liable party is usually excluded due to the channeling.¹⁴⁵

Exclusive channeling in the international conventions means that the victim can, in principle, only file a law suit against the indicated person, e.g. the licensee (in case of nuclear accidents) or the tanker owner (in case of marine oil pollution). In that sense, the channeling is "exclusive" since a claim against other parties is (usually) not allowed. However, exclusive channeling does not mean that liability is allocated in a final way. The licensee or operator who is held liable still has the possibility of a right of recourse against a third party who may be liable. In addition, it might be possible to pass on liability, e.g. on the basis of contract. This may be the case if, for example, defective materials were delivered to the licensee of a nuclear power plant. If such a shifting of the liability burden could take place, one could argue that the liability is simply transferred. Moreover, economists could argue that such a reallocation complies with the principles of the Coase theorem.¹⁴⁶ Indeed, an efficient allocation of resources nevertheless took place to the extent in which the ones who actually contributed to the loss are still held liable.

144. See WANG, *supra* note 99, at 82.

145. See LIU, *supra* note 102, at 212.

146. See Michael Trebilcock & Ralph Winter, *The Economics of Nuclear Accident Law*, 17 INT'L REV. L. & ECON. 215, 232–35 (1997).

However, this private reallocation of liability may not always be possible and, as discussed *supra*, the scope for recourse according to the conventions is in some cases quite limited. From that perspective, channeling of liability can hardly be considered as an efficient mechanism for the prevention of accidents or as an optimal tool for victim compensation.

The March 2011 Fukushima incident in Japan illustrates some of the undesirable consequences of channeling. The first reports on the Fukushima case made clear that the meltdown of the nuclear reactors may have been caused by the simple fact that the generators for the cooling system were located in the basement of the turbine buildings, which of course made them vulnerable to a tsunami.¹⁴⁷ Was this the result of negligent action by the operator, TEPCO, or rather the result of bad design or engineering by General Electric? In the former case, a channeling of the liability to TEPCO would be problematic since channeling would lead to an exclusion of liability of all other parties who may have contributed to the risk—in this particular case (at least potentially), General Electric. The Fukushima case suggests that channeling can be problematic in removing incentives for prevention from other parties who are able to limit or otherwise influence a risk.¹⁴⁸

E. Insurability

Finally, we turn to the consequences of channeling from an insurability perspective. As discussed *supra*, a major disadvantage of joint and several liability is that one injurer (and therefore his liability insurer) may be held to compensate not only for the loss caused by that injurer, but also for the loss caused by others. Therefore, channeling, which is, in fact, the reverse of joint and several liability, should be an ideal system from an insurability perspective. Channeling has the advantage of making clear that a suit can only be brought against one actor, which would make the life of liability insurers much easier. Indeed, some have argued that channeling is

147. See Reiji Yoshida, *GE Plan Followed with Inflexibility*, JAPAN TIMES (July 14, 2011), <http://www.japantimes.co.jp/news/2011/07/14/news/ge-plan-followed-with-inflexibility/#.VowMH5MrLVo>.

148. See Michael Faure & Jing Liu, *The Tsunami of March 2011 and the Subsequent Nuclear Incident at Fukushima: Who Compensates the Victims?*, 37 WM. & MARY ENVTL. L. & POL'Y REV. 129, 213–14 (2012). Japan did not follow the international conventions but introduced its own Nuclear Liability Act. This Act is, however, largely shaped on the basis of the same principles as the international conventions and hence equally contains a channeling of liability to the licensee of the power plant.

useful since it can improve the insurability of risks.¹⁴⁹ Specifically, in the nuclear context, only the licensee of a nuclear power plant would have to take out insurance coverage.¹⁵⁰ Additionally, some defend channeling in oil pollution cases on the ground that it would reduce insurance costs.¹⁵¹ Only the tanker owner (and no other parties) would have to take out insurance coverage.¹⁵² However, this insurance argument is rather simplistic and to some extent even incorrect.¹⁵³

Assume that parties other than the licensee of the nuclear plant or the tanker owner would be held liable; they could in that case obviously purchase liability insurance as well and, if liability rules were applied correctly, their exposure to liability would be limited to the extent to which they contributed to the loss. In other words: if each and every party is held separately (proportionally) liable for its own contribution to the risk, liability insurance is possible and an inefficient regime such as channeling does not have to be used to increase insurability. Indeed, the mere fact that without channeling several potentially liable parties will take out insurance coverage does not mean that total insurance costs will rise.¹⁵⁴

Exclusive channeling may even have disadvantages for the liability insurer of the channeled operator. Indeed, the insurer may also have to cover accidents in cases where the loss was not caused by his insured, but where the damage is only allocated to the operator because of the channeling regime. Since channeling does not provide adequate incentives to other parties who contributed to the loss, channeling can even increase the liability exposure for the liability insurer. Channeling thus creates a greater risk exposure for the operator and therefore a higher uncertainty for the insurer. Therefore, if channeling has any effect on the insurability, it is more likely to decrease insurability rather than make liability better insurable.

149. With respect to the channeling for oil pollution liability, see, *inter alia*, A.H.E. Popp, *Liability and Compensation for Pollution Damage Caused by Ships Revisited: Report on an International Conference*, LLOYDS MAR. & COM. L. Q. 118, 120 (1985).

150. See Herman Cousy, *Een nieuwe vorm van schuldloze aansprakelijkheid voor schade veroorzaakt door het vreedzaam gebruik van kernenergie*, JURA FALCONIS 35, 46 (1974–1975).

151. See Popp, *supra* note 149, at 120.

152. See *id.*

153. See Vanden Borre, *supra* note 143, at 366–67; VANDEN BORRE, *supra* note 120, at 695–97; Tom Vanden Borre, *Kanalisaatie in het debat betreffende de verzekeraarbaarheid van een risico*, AANSPRAKELIJKHEID, VERZEKERING EN SCHADE 180–82 (2001).

154. See VANDEN BORRE, *supra* note 120, at 696.

VI. VICARIOUS LIABILITY

Finally, this article will briefly discuss a third situation where liability is stretched beyond the original tortfeasor and where someone is held liable for acts committed by another person. "Vicarious liability" has been discussed at great length in the law and economics literature.¹⁵⁵ Therefore, this article will discuss this phenomenon rather briefly.

A. *Respondeat Superior*

As discussed *supra*, when addressing joint and several liability under domestic tort law, there are many situations in which persons are held liable for damage caused by an auxiliary. This is referred to as the common law principle of *respondeat superior* or vicarious liability.¹⁵⁶ Liability is not strict, but, for example, employers are held liable for damage caused by the negligence of their employees¹⁵⁷; schools are held liable for torts committed by students under their care¹⁵⁸; and parents are held liable for torts committed by their children.¹⁵⁹

In some cases, there may be strict vicarious liability. The employer would be liable for all harms caused by an employee, without the plaintiff being required to show fault on behalf of the principal.¹⁶⁰ Fault is often presumed.¹⁶¹ In other cases, vicarious liability would be based on negligence. The principal (an employer) would only be liable in a case of negligent supervision of an employee.¹⁶² Strict liability obviously makes the burden of proof on the victim lighter.¹⁶³ Many legal systems have such

155. For a summary of the literature see, *inter alia*, Reinier H. Kraakman, *Vicarious and Corporate Civil Liability*, in 1 TORT LAW AND ECONOMICS, *supra* note 12, at 134–49.

156. For a detailed account of the treatment of vicarious liability see the contributions in UNIFICATION OF TORT LAW: LIABILITY FOR DAMAGE CAUSED BY OTHERS (Jaap Spier ed., 2003).

157. For a comparative overview see Susanne Galand-Carval, *Comparative Report on Liability for Damage Caused by Others. General Questions*, in UNIFICATION OF TORT LAW: LIABILITY FOR DAMAGE CAUSED BY OTHERS, *supra* note 156, at 300–04.

158. See generally VAN GERVEN ET AL., *supra* note 20, at 522–35.

159. Galand-Carval, *supra* note 157, at 294–98.

160. *Id.* at 300.

161. This is, for example, the case in Belgium where all of the civil code employers are held strictly liable for damage caused by their employees. See Michael Faure & Roger Van den Bergh, *Negligence, Strict Liability and Regulation of Safety under Belgian Law: An Introductory Economic Analysis*, 12 GENEVA PAPERS ON RISK & INS. 95, 102–03 (1987).

162. See Reinier Kraakman, *Economic Policy and the Vicarious Liability of Firms*, in RESEARCH HANDBOOK ON THE ECONOMICS OF TORTS 238 (Jennifer Arlen ed., 2013) for the difference from an economic perspective.

163. See COOTER & ULEN, *supra* note 13, at 382.

rules of liability for torts committed by the subordinate, although the conditions for such liability can differ.¹⁶⁴

B. Economic Rationale

From an economic perspective, designating the liable party in this contractual setting (between an employer and an employee) is unimportant, as long as the liability is freely transferable and both parties are fully informed. This would imply that when, for example, an employer would be held liable for a tort committed by his employee, the employer could sanction the liable employee, e.g. via lower wages, pay reimbursement, or denial of future promotions. If it were the employee who first paid the compensation, he could claim reimbursement from the employer. In this line of reasoning, it would be unimportant where the liability is imposed (on the employer or the employee) since in this contractual relationship, the parties could freely allocate the liability according to their preferences. This is obviously an application of the well-known Coase theorem.¹⁶⁵

In practice, however, such an allocation of liability between principals and agents is not always possible, *inter alia*, because of the limited wealth (and hence potential insolvency) of the agent.¹⁶⁶ Indeed, the starting point for the economic analysis of vicarious liability is that auxiliaries, like employees, can exercise dangerous activities that can create serious risks for third parties—so-called externalities.¹⁶⁷ Often the damage that agents could cause as a result of the activity may largely outweigh its personal wealth.¹⁶⁸ As a result, these employees will be considered judgment proof, which will lead to underdeterrence.¹⁶⁹ The lawmaker may consider that the employer has more wealth than his auxiliary. Hence, the employer may have more incentive to take proper care; vicarious liability can provide these incentives. Given the larger wealth of the employer, he has more incentive and risks less suffering from underdeterrence as a result of insolvency. Moreover, the employer has the possibility of controlling the auxiliary via monitoring and could, therefore, also increase the level of care exercised by the

164. For a detailed analysis of the liability for damage caused by others in various legal systems see the contributions in UNIFICATION OF TORT LAW: LIABILITY FOR DAMAGE CAUSED BY OTHERS, *supra* note 156.

165. See R. H. Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1, 1–44 (1960).

166. See Kraakman, *supra* note 155, at 135.

167. See Landes & Posner, *supra* note 82, at 914–16 (1980) for the economic foundation for the rule of *respondeat superior*.

168. See Kraakman, *supra* note 162, at 241–48.

169. Landes & Posner, *supra* note 82, at 914.

employee. For example, an employer can provide safer material to the employee or take disciplinary measures for the negligent employee.

The simple economic basis for vicarious liability is the belief that shifting liability to the party with more wealth will provide better incentives for prevention.¹⁷⁰ The employer/principal could hence act as a gatekeeper. Holding the gatekeeper vicariously liable for the torts committed by the agent provides incentives for efficient monitoring of agents by the principals. This same reasoning is also the rationale for corporate criminal liability.¹⁷¹

C. Critics

Notwithstanding the potential advantages of vicarious liability, recent scholarship has pointed at potential problems with vicarious liability.¹⁷² One problem, as mentioned by Steven Shavell,¹⁷³ is that vicarious liability assumes that principals have more capital than agents.¹⁷⁴ This is not necessarily so. Undercapitalization of principals—more particularly, corporate entities—is possible as well. Hence, there is a strong argument for imposing individual liability in combination with liability of the principal.¹⁷⁵

Another criticism on the use of vicarious liability has been formulated by Jennifer Arlen. She argues that the traditional argument in favor of vicarious liability is seen as an indirect means of sanctioning wrongful employees, assuming that corporations subject to criminal liability will, in turn, sanction the wrongful agent.¹⁷⁶ This regime can, according to Arlen, lead to potentially perverse incentives for the following reason: if a corporation is able to monitor its employees optimally, it will have to increase its

170. See Kraakman, *supra* note 155, at 134–49.

171. See, *inter alia*, Mark A. Cohen, *Criminal Law as an Instrument of Environmental Policy: Theory and Empirics*, in *LAW AND ECONOMICS OF THE ENVIRONMENT* 208–09 (Anthony Heyes ed., 2001); Lawrence Friedman, *In Defense of Corporate Criminal Liability*, 23 *HARV. J. L. & PUB. POL'Y* 833, 833–58 (2000).

172. For a detailed analysis of all factors mitigating against strict vicarious liability see Kraakman, *supra* note 155, at 137–40.

173. SHAVELL, *ECONOMIC ANALYSIS*, *supra* note 4, at 174.

174. See SHARON ODED, *INDUCING CORPORATE PROACTIVE COMPLIANCE: LIABILITY CONTROLS & CORPORATE MONITORS* 172–79 (2012) for further information on the economic functions of vicarious liability within corporations.

175. See Lewis A. Kornhauser, *An Economic Analysis of the Choice between Enterprise and Personal Liability for Accidents*, 70 *CAL. L. REV.* 1345, 1345–92 (1982); A. Mitchell Polinsky & Steven Shavell, *Should Employees be Subject to Fines and Imprisonment Given the Existence of Corporate Liability?*, 13 *INT'L REV. L. & ECON.* 239, 239–57 (1993).

176. See Jennifer Arlen, *Economic Analysis of Corporate Criminal Liability: Theory and Evidence*, in *RESEARCH HANDBOOK ON THE ECONOMICS OF CRIMINAL LAW* 144 (Keith Hylton & Alon Harel eds., 2012).

level of corporate enforcement expenditures.¹⁷⁷ This might reduce the number of agents who commit crime by increasing the probability of detection and thus reducing the costs of crime. On the other hand, the increased enforcement expenditures may also increase the probability that the government will detect those crimes, whereby corporations' expected criminal liability for those crimes is increased.¹⁷⁸ This means that additional enforcement by firms only increases the firms' expected criminal liability. Thus, vicarious liability could lead to the perverse incentive that a corporation will reduce the monitoring of its employees in order to avoid the detection of corporate (environmental) crime.¹⁷⁹ Although the criticism of Arlen is directed at corporate criminal liability, the "potentially perverse" effects that she refers to could equally apply to vicarious liability for torts.¹⁸⁰ This has been an argument raised against strict vicarious liability,¹⁸¹ and in favor of negligence based or so-called composite vicarious liability regimes.¹⁸²

VII. CONCLUDING REMARKS

In this article, the attribution of liability was reviewed and a few atypical cases were discussed from a legal, as well as from an economic, perspective. Difficult attribution questions often arise when we move outside of the simple case where one injurer causes harm to one identifiable victim. There are complications from the moment more than one tortfeasor is involved. The starting point from an economic perspective is that tortfeasors should still be provided with incentives for taking efficient care and maintaining efficient activity levels.

This article also demonstrated that a model of solidary liability (often referred to as joint and several liability) might meet this goal on the condition that a negligence standard is applied. This amounts to a model where one tortfeasor—the one who is addressed by the victim—will pre-finance compensation and will subsequently (via recourse) ask contribution from the other tortfeasors involved. To the extent that the other tortfeasors are identified and solvent they will contribute to the extent that they effectively caused the harm, in which case they are efficiently deterred.

177. See Jennifer Arlen & Reinier Kraakman, *Controlling Corporate Misconduct: An Analysis of Corporate Liability Regimes*, 72 N.Y.U. L. REV. 687, 687–779 (1997).

178. *Id.*

179. Jennifer Arlen, *The Potentially Perverse Effects of Corporate Criminal Liability*, 23 J. LEGAL STUD. 833, 833–67 (1994).

180. See Arlen & Kraakman, *supra* note 177, at 687–779.

181. See COOTER & ULEN, *supra* note 13, at 382. They hold: "Strict liability gives the employer an incentive to remain silent in the hope of escaping detection."

182. See ODED, *supra* note 174, at 186–87; Kraakman, *supra* note 155, at 142–44.

More problems also arise when either a strict liability standard is applied or when one or more of the contributing tortfeasors is insolvent. In these cases, allocating liability just to the tortfeasor who was sued by the victim may lead to overdeterrence and potentially to crushing liability. This could *de facto* lead to a reduced activity level of that one particular tortfeasor since he is exposed to harm not caused by his activity. In these cases, a proportional solution, i.e. exposing the tortfeasor only to the extent to which he has contributed to the harm, may be more desirable. Obviously, this may lead to more difficulties for victims in bringing the suit (since they potentially will have to sue all tortfeasors and obtain a partial recovery from each of them). Hence, there is no easy answer since joint and several liability may have advantages, but it may have disadvantages as well, such as endangering the insurability of the risk.

The same is also the case for the phenomenon of vicarious liability to some extent. Again, there are strong arguments in favor of vicarious liability of principals for the acts of their agents, but this is largely based on the assumption that principals have better capitalization than their agents, which may not always be the case. Moreover, strict vicarious liability could even lead to the perverse effect of reducing the internal monitoring by the principal—more particularly a corporate actor.

Problems also arise when the legislature intervenes and solely allocates liability to one of the many possible actors, so-called channeling of liability. The arguments against this instrument seem to be overwhelming. One could defend channeling as a mechanism where liability is allocated to the cheapest cost avoider, but that does not always explain why others who equally contribute to the risk should be totally excluded from liability. Additionally, the insurability argument cannot satisfactorily justify channeling. The history—specifically of the nuclear liability conventions—shows that channeling of liability is the result of interest group politics rather than of the design of an efficient accident law.

It is interesting to note that in the law, more particularly in the recently adopted *Principles of European Tort Law* (PETL), a clear choice is made in favor of proportional liability (particularly in cases where there is causal uncertainty). However, when causation is clear and more than one tortfeasor contributed to causing the harm, the *Principles* opt for solidary liability. That is an interesting distinction which certainly merits further research.

There are also other cases where tort law moves liability beyond the original tortfeasor. One can think of extending liability, for example, to

lenders (like financial institutions)¹⁸³ or manufacturers (extended producer responsibility).¹⁸⁴ The possible economic justifications in favor of those extensions remain beyond the scope of this article, but are certainly worth noting. A trade-off often has to be made in many of these cases, like the ones discussed *supra*, where tort law moves beyond the original tortfeasor. There is a conflict between the advantages of those extended liability regimes (by, for example, providing additional incentives for monitoring, gatekeeping and control), versus increased administrative costs and the danger of overdeterrence, potentially leading to a chilling effect.¹⁸⁵ It is precisely because the solutions to those trade-offs often go beyond economics and are also based on (distributional) policy choices that these answers may largely differ between legal systems. However, economic analysis can undoubtedly enrich the policy debate and lead to better-reasoned policy decisions.

183. See James Boyd & Daniel E. Ingberman, *The Search for Deep Pockets: Is "Extended Liability" Expensive Liability?*, 13 J. L. ECON. & ORG. 232, 232–58 (1997).

184. See Karl Lidgren & Göran Skogh, *Extended Producer Responsibility: Recycling, Liability, and Guarantee Funds*, 21 GENEVA PAPERS ON RISK & INS. 170, 170–81 (1996) for a discussion on extended producer responsibility.

185. See Jef De Mot & Michael Faure, *Public Authority Liability and the Chilling Effect*, 22 TORT L. REV. 120, 120–33 (2014) for a discussion on chilling effects in public authority liability.

