Tort Law and Judicial Risk Regulation: Bipolar and Multipolar Risk Reasoning in Light of Tort Law's Regulatory Effects

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Abstract

Although judicial decisions in tort law primarily determine the (correlative) responsibilities and liabilities of the proceeding parties, they also have regulatory effects on non-litigants. In this contribution, these regulatory consequences of tort law will be analysed in light of a court's quest when it decides a tort claim involving (uncertain) risks. It will be argued that decisions in tort law about uncertain risks involve the possible occurrence of a false positive (eg accepting liability for a non-existing risk) and a false negative (eg denying liability for a real risk). False positives and false negatives have adverse consequences for the parties to the proceedings but, bearing in mind the regulatory effects of tort adjudication, potentially also for non-litigants. While courts might want to avoid both, scientific uncertainties and complexities make it difficult for them to assess to what extent there is a chance of either a false positive or a false negative occurring. Therefore, they necessarily need to determine which party bears the risk of the involved errors. In addition, the question arises whether courts should also take the potential regulatory consequences of their rulings into account and, if yes, how? To that purpose, they can employ a bipolar reasoning style and a multipolar reasoning style. Although tort law is about determining the applicable rights and obligations between the plaintiff and defendant (bipolar reasoning), in light of the regulatory implications of tort law and developments in several tort systems, the relevance of considerations transcending this bipolar relationship (multipolar reasoning) is increasing. However, the possibilities for courts to engage in multipolar reasoning are restrained by the bipolar nature of tort law which gives rise to information and specialism deficits. This will be illustrated by referring to issues in relation to setting the standard of care and examining causation.

I. Introduction

1. Tort law as regulation

Protecting human health and the environment against technological and catastrophic risks is a central but also a complex challenge for modern society. Although it is accepted that governments have the primary responsibility to regulate risks, they also face several

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difficulties in fulfilling this task.[1] In light of perceived and sometimes also real governmental failures, the complementary role of civil courts as risks regulators is in the spotlight.[2]

First, through injunctive and/or declaratory relief proceedings courts can be asked to fill the regulatory gaps ensuing from alleged imperfections in governmental risk regulation. An example that, although it is pending on appeal and thus might be overturned, draws the considerable attention of politicians, academics, and practitioners, is the Dutch *Urgenda* ruling. In that injunctive relief case, the District Court of The Hague ordered the Dutch State to cut its greenhouse emissions by 25% in 2020 compared to its emission levels in 1990.[3] In The Netherlands injunctive relief also has been used to attack alleged regulatory failures on other risks than those posed by climate change, such as air pollution and tobacco.[4] Central to these proceedings is that the plaintiff, most of the time an interest group, aims to change the social status quo in relation to the litigated environmental or health problem. In other words, they use the law as an instrument for social change.

Second, while the regulatory effects of tort adjudication are observable in the context of injunction lawsuits dealing with allegedly failing governmental policies, also in the context of claims for damages civil courts act as semi-risk regulators. In deciding on claims for damages, a judge determines the legally required level of safety and gives his vision about a proper allocation of damages. This norm amplification is seen in many areas of environmental and health law, especially in cases where the regulator did not set the (appropriate) standards.[5]

These regulatory effects of tort law, which will be discussed more in depth below, are welcomed, but also contested. For instance, law and economic scholars put emphasis on the economic comparative (dis)advantage of courts as decision-makers on risks in comparison to public authorities.[6] Their main point of focus is to identify parameters that

[1] Scientific uncertainties about risks, economic interests that are at stake, corporate lobbying, created doubt by industry and the potential of regulatory capture, all complicate governmental risk regulation. See, for an illustration, European Environmental *Agency, Late lessons from early warnings: science, precaution, innovation* (EEA 2013); P Harremoës (ed.), *Late lessons from early warnings: the precautionary principle 1896-2000* (Environmental issue report No 22) (EEA 2001).

[2] See inter alia WK Viscusi (ed.), *Regulation through Litigation* (American Enterprise Institute–Brookings Institution 2002); AP Morris, B Yandle and A Dorchak, *Regulation by Litigation* (Yale University Press 2008) 1; B Ewing and D Kysar, "Prods and Pleas: Limited Government in an Era of Unlimited Harm" (2011) 121 *Yale Law Journal* 350; P Luff, "Risk Regulation and Regulatory Litigation" (2011) 61 Rutgers Law Review 73; MG Faure, "The complementary roles of liability, regulation and insurance in safety management: theory and practice" (2014) 17 Journal of Risk Research 689; J Spier and U Magnus, *Climate Change Remedies* (Eleven International Publishing 2014) 2-155; L Enneking and ER de Jong, "Regulering van onzekere risico's via *public interest litigation*?" (2014) 23 Nederlands Juristenblad 1542; ER de Jong, "Rechterlijke risicoregulering bij gezondheids- en milieurisico's" (2015) Ars Aequi 872; P Luff, "The Political Economy of Court-Based Regulation" in U Mattei and JD Haskell (eds), *Research Handbook on Political Economy and Law* (Edward Elgar 2015) 192.

[3] District Court of The Hague, 24 June 2015, ECLI:NL:RBDHA:2015:7145. See, for a description of this judgment in light of judge made risk regulation, ER de Jong, "Dutch State Ordered to Cut Carbon Emissions" (2015) 6 EJRR 448.

[4] District Court of The Hague, 7 September 2017, ECLI:NL:RBDHA:2017:10171; HR 10 October 2014, ECLI:NL:HR:2014:2928, Nederlandse Jurisprudentie 2015/12, comm. EA Alkema; District Court of The Hague, 09 November 2015, ECLI:NL:RBDHA:2015:12746.

[5] See for references section II.2.

[6] S Shavell, "Liability for Harm versus Regulation of Safety" (1984) 13 Journal of Legal Studies 357. See also Faure, supra, note 2, and Van Zeben in this special issue.

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determine who can create the most optimal and cost-effective risk regulation. Judicial risk regulation can also be assessed from the separation of power doctrine.[7] In that regard some might stress that judicial risk regulation is at odds with this doctrine and would lead to judicial "intervention" in traditional domains of public policy.[8] Others accept that it is the courts' role to enhance the rule of law and offer legal protection to citizens against failing industries or governments.[9] The regulatory effects of judicial dispute resolution in a concrete matter could be seen as an unintended but nonetheless beneficial side effect.[10] Besides, by offering recourse to victims the accountability of public authorities and powerful private actors can be enhanced. Consequently, tort law empowers groups of citizens to stand up for their interests and, as a last resort, ensure they are not forgotten or marginalised as a consequent of access barriers to the political arena.[11] This effect of tort law ultimately enhances democracy and the rule of law.

2. Courts as risk regulators

This article takes the courts' perspective. While from several perspectives the regulation effects of tort law can be embraced or rejected, courts have less room for such manoeuvre. They must decide, and their decisions can have regulatory effects. Thus, to them the issue is not whether to engage in decisions that (might) have regulatory implications, but *how* to engage. If we know the answer to that question, we can learn something about the proper role of tort law as a risk regulatory mechanism and thus add something to the academic debate on the desirable goals of tort law.[12]

Section II identifies the potential regulatory effects of tort adjudication, by referring to three regulatory characteristics of tort adjudication. Following this inventory, these features will be analysed in view of a court's quest when it decides a tort claim involving risk and uncertainty. To that purpose, first, the essence of judicial decision-making in relation to uncertain risks will be discussed in Section III. It will be argued that judicial decisions involve the possible occurrence of a false positive (eg accepting liability for a non-existing risk) and a false negative (eg denying liability for an actual risk). The possible occurrence of both have negative implications for the parties to the proceedings and, bearing in mind the regulatory effects of tort law, potentially, also for non-litigants. Although courts might want to avoid the occurrence of both, scientific uncertainties and

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7 See on this issue the contribution of M Loth in this special issue.

8 L Bergkamp, "A Dutch Court's 'Revolutionary' Climate Policy Judgment: The Perversion of Judicial Power, the State's Duties of Care, and Science" (2015) 12 Journal for European Environmental and Planning Law 241.

9 R van Gestel and M Loth, "Urgenda: roekeloze rechtspraak of rechtsvinding 3.0?" (2015) 37 Nederlands Juristenblad 2598. See, in relation to Dutch courts, ER de Jong, "Dutch Tort Law at the Crossroads: Judicial Regulation of Health and Environmental Risks" in M Dyson (ed.), *Regulating Risk through Private Law* (Intersentia 2018).

10 See eg the contribution of Kysar in this special issue. See in general, on this civil recourse theory, JCP Goldberg and BC Zipursky, "Tort law and Responsibility" in J Oberdiek (ed.), *Philosophical Foundations of the Law of Torts*, (Oxford University Press 2014); see, in relation to public authority liability, P Cane, "Tort Law and Public functions" in Oberdiek, supra.

11 Eg due to cost barriers and the influence(s) of lobby practices.

12 The argument will be mainly illustrated by experience in The Netherlands, a civil law jurisdiction, and in the common law world, especially jurisdictions in the US. The aim of this article is not, however, to give an exhaustive overview on how courts dealt with risk regulatory lawsuits in these jurisdictions. Although the jurisdictions differ on the level of detail, on the general substance they are comparable. See also U Magnus, "Why is U.S. Tort Law so Different?" (2010) 1 Journal of European Tort Law 102. And for Europe, C van Dam, *European Tort Law* (2nd edn, Oxford University Press 2013).

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complexities make it especially difficult for them to assess to what extent there is a chance that one or both occurs. Accordingly, courts necessarily need to decide which party bears the risk of the involved errors. In addition, the question arises whether courts should also take the potential regulatory consequences of their rulings into account and, if yes, how? To that end, they can employ a style of bipolar reasoning and multipolar reasoning, which is the subject of Section IV. However, the possibilities for courts to engage in multipolar reasoning are restrained by the bipolar nature of tort law which gives rise to information and specialism deficits. The remaining sections illustrate how courts could (not) use these styles of reasoning when addressing two legal issues that arise in the context of scientific uncertainty, such as determining the duty of care and examining causation as will be discussed in Section V. Section VI draws conclusions.

II. Tort law's regulatory effects

1. Introduction

The primary function of civil courts is individual dispute resolution. However, such dispute resolution can also have regulatory effects, transcending the interests of the litigants. Although the nature of remedies (eg injunctions or damages), defendants (eg private actors or public authorities) and claimants (eg individual victims, private actors, and interest groups) can differ in tort law, the potential regulatory implications of tort adjudication can be described by referring to three common characteristics of judicial decisions in tort law. Whereas some of the characteristics are, by their nature, implied in court rulings and hence belong to the core of judicial dispute resolution, most of them relate to either intended or unintended side consequences of the reception of such rulings in society.[13]

2. Regulatory standard setting and public education

First, tort adjudication performs a social function by educating the public, policymakers, private actors, and practitioners about the appropriate way of dealing with a risk. Above, all courts operate as regulatory standard setters. Although court rulings primarily have binding force between the parties to the proceedings, courts set precedents that, depending on the content and scope of a decision, also determine the legally required conduct of non-litigants belonging to the same social group as the defendant.[14] Moreover, through rulings courts amplify norms of social and legal importance thereby given the actors who are involved in risk regulation on several levels (global, supra-national, national and local) guidance about the desired risk regulatory standards.[15] Tort adjudication enhances problem signalling, and leads to the legal (de)legitimising of the

[13] See on this topic in general N MacCormick, "On Legal Decisions and Their Consequences: From Dewey to Dworkin" (1983) New York University Law Review 239.

[14] WK Viscusi, "Overview" in Vicusi, supra, note 2, 19–20. This norm amplificaion can be observed in relation to, *inter alia*, decision about the applicable standards, causation requirements, (actionable) damages and standing requirements and is especially present when courts stretch the boundaries of these legal concepts in order to accommodate the plaintiffs claim.

[15] M Lee, "Safety, Regulation and Tort: Fault in Context" (2011) 74 Modern Law Review 555, 561.

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way actors in society deal with risks. As Linden put it, civil courts can perform a sort of ombudsman function by addressing issues that socially do not receive the attention indicated.[16]

Both courts and regulators respond to each other's alleged failures in addressing issues of social importance. In that respect it should be stressed that some authors see in the failure of courts to deal with the hazard of the industrial revolution, an explanation for the rise of the regulatory state.[17] Others, however, argue that courts play an important gap-filling role.[18] The successes and failures of both litigation and regulation determine each regulatory role. In this contribution the focus is on the role of the court.

The way a Western court dealt with asbestos litigation is exemplary for this role of the courts. Asbestos litigation has been a major driver in developments in the tort law. It led to the acceptance of new or the stretching of existing legal concepts, such as the duty of care, limitation periods and causation requirements.[19] For instance, from the 1990s the Dutch Supreme Court accepted high standards of care on several occasions, especially in those circumstances where specific public regulations were lacking or were inadequate. And while it primarily offered recourse for victims of the risk behaviour of the defendant,[20] the court also filled (perceived) regulatory gaps or imperfections in risk regulation by repeatedly ruling that private actors, such as producers and employers, are under the (proactive) duty to take measures to prevent asbestos-related diseases. The court even repeatedly ruled that the fact that the use of asbestos was socially accepted, or even stimulated by the government, does not dismiss the responsibility of operators dealing with asbestos. This case law has set a precedent in the Netherlands, also across the case law of other risks in the jurisprudence of the Supreme Court, such as the risk associated with the use of lead paint.[21]

The preceding does not, of course, mean that courts are always willing to operate as gap-fillers. Strengthened by the flexibility of tort law and some courts' willingness to allow claims for health and environmental risks, plaintiffs might invite courts to stretch the boundaries of tort law even more to fully embrace tort law's regulatory potential. In some instances, these claims balance on the boundaries of tort law. A striking example in this respect can be found in US litigation relating to climate change, gas additives, destruction of fishing stock and litigation against manufacturers of *inter alia* asbestos,

[16] AM Linden, *Canadian Tort Law* (5th edn, Butterworths 2012) 22–24.

[17] See, for a discussion of the rise of regulation because of the failures of courts, EL Glaeser and A Shleifer, "The Rise of the Regulatory State" (2003) XLI Journal of Economic Literature 401; A Shleifer, *The Failures of Judges and the Rise of Regulator* (MIT Press 2012).

[18] Eg P Cane, "Tort Law as Regulation" (2002) 31 Common Law World Review 305, 312 and 320–322.

[19] See also section V.3. See, for a discussion on how climate change might influence doctrinal tort law, DA Kysar, "What Climate Change can do about Tort Law" (2011) 41 Environmental Law 1.

[20] See especially HR 6 April 1990, ECLI:NL:HR:1990:AB9376, *NJ* 1990/573, comm. PA Stein (*Janssen/Nefabas)*; HR 25 June 1993, ECLI:NL:HR:1993:AD1907, *NJ* 1993/686, comm. PA Stein (*Cijsouw I*). HR 17 December 2004, ECLI:NL:HR:2004:AR3290, *NJ* 2006/147, comm. CJH Brunner (*Hertel/Van der Lugt*); HR 25 November 2005, ECLI: NL: HR:2005:AT8782, *NJ* 2009/103, comm. I Giesen (*Eternit/Horsting*).

[21] HR 7 June 2013, ECLI:NL:HR:2013:BZ1721, *NJ* 2014/99, comm. T Hartlief (*Lansink/Ritsma)*. See I Giesen, ER de Jong and MA Overheul, "Risks: how Dutch tort law responds to risks and how the law can shape risks" in M Dyson, supra, note 9. Sometimes the legislature intervenes. A striking example relates to the ruling of the English Supreme Court in *Barker v Corus Ltd* [2006] 2 AC 572, where it denied joint and several liability for solvent employers that exposed their employees, but where others are also responsbile for the exposure but are not solvent. The introduction of the Compensation Act 2006 reversed this ruling for situations of mesothelioma.

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tobacco, lead paint and guns on the basis of the tort of public nuisance.[22] According to the American Restatement (second) of Torts, "a public nuisance is an unreasonable interference with a right common to the general public."[23] Although product liability would be the logical basis for a claim against manufacturers of many of the above-mentioned risks,[24] the plaintiffs, who were private individuals but also States, attempt (ed) to move the tort of public nuisance beyond its traditional meaning to make it a "catch all tort" for industrial risks that are posed to the public at large. Under this tort it would be easier to prove liability for risks imposed on society as such, than it is on the basis of other liability standards, such as negligence or product liability. Consequently, the tort of public nuisance would provide a major vehicle for successfully attacking lethal (but also legal) products through tort law. For most of the courts,[25] such a broad tort of public nuisance has been a bridge too far and thereby they are acknowledging the limits of their role as risk regulatory standard setters. By denying these claims they explicitly considered that, *inter alia*, the products as such are legal, accepting a broad tort leads to floodgate concerns and its application requires the balancing of several interests which does not belong to the courts' domain but to the legislators'.[26] It is beyond the topic of this contribution to assess the validity of the results of this litigation.[27] The point to be made is that these rulings also amplify norms and give guidance about the role tort law can or cannot play in the context of risk regulation. In a sense, one could even argue that it legitimises the use of the products or technologies that were subjected to litigation.

The above-painted picture is in practice complex. It is not easy to quantify and specify tort's regulatory effects. First, except for anecdotal material and case studies there is not much structural empirical knowledge of the actual social impact of court rulings and the causal mechanisms that influence to what extent *specific rulings* perform an educational function.[28] Secondly, each case is factually unique and, particularly in negligence-based claims, the facts to a great extent determine the outcome of a case. For instance, in many systems to establish liability under negligence, courts use a list of non-exhaustive viewpoints in examining whether the defendant owed a duty of care towards the plaintiff,

[22] The tort of public nuisance stems from the old English common law and traditionally belongs to the domain of criminal law. In England and Wales some commentators would argue that the tort does not belong to the domain of tort law, since it is concerned with public interests and not with private interests: NJ McBride and R Bagshaw, *Tort Law* (5th edn, Pearson Longman 2015); C Harlow, *State Liability* (Oxford University Press 2015) 658 et sqq. See, for a general discussion of the tort and its critics in England and Wales, JW Neyers, "Reconceptualising the tort of public nuisance" (2017) 76 Cambridge Law Journal 87.

[23] Restatement (sec.) of Torts, §708 to the end, §821B(1). For a description of the other elements of the tort under US law see also RO Faulk and JS Gray, "Alchemy in the Courtroom: The transmutation of Public Nuisance Litigation" (2007) Michigan State Law Review 941, 962–964.

[24] Faulk and Gray, supra, note 25, 948; VE Schwartz and P Goldberg, "The Law of Public Nuisance: Maintaining Rational Boundaries on a Rational Tort" (2005–2006) 45 Washburn Law Journal 541.

[25] There are a few exceptions. See Faulk and Gray, supra, note 25.

[26] Interestingly, states also attempted to push the tort in this direction. According to Faulk and Gray especially this state litigation undermines the separation of powers theory, Faulk and Gray, supra, note 25, 974.

[27] Two legal explanations can be given for this reluctance: the harm is public and not private and the tort as such is vague.

[28] P Cane, "Consequences in Judicial Reasoning" in J Horder (ed.), *Oxford Essays in Jurisprudence* (Oxford University Press 2000); see, for an exception and interesting study on the possibility of courts to bring about social change, N Rosenberg, *The Hallow Hope. Can Courts Bring About Social Change?* American Politics and Political Economy Series (2nd edn, University of Chicago Press 2008).

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such as the severity of the risk and the burden of precaution. These viewpoints and their application vary according to *inter alia* the characteristics of the risk involved, the nature of the parties involved and their underlying legal relationship. The reasoning of courts based on these viewpoints is often tailored to the specific facts at hand, thereby leaving the broader meaning and scope of such a ruling potentially somewhat in the clouds, although established case law gives some general rules (eg "more precaution is required when the risk is more severe").

3. Behavioral and policy effects

Next, tort adjudication could affirm or alter the behaviour and/or risk management policies of private actors or public authorities. In this respect, one could make a distinction between actor specific behavioural effects, actor general behavioural effects, risk specific behavioural effects and risk general behavioural effects, although the distinctive line between the several concepts is thin.[29] Depending on the combination of the occurrence of these effects, the regulatory impact of tort adjudication can be wider or narrower. Again, however, the lack of comprehensive empirical evidence should be borne in mind.

Tort adjudication has *specific behavioural effects* when a parties' practice is affirmed by a court's decision, when a party is legally forced to change its behaviour or when the actor wants to avoid being exposed to further legal proceedings, eg for reasons of public exposure and publicity, costs of litigation and costs of awarded damages.

General behaviour effects relate to tort law's effect on the behaviour and/or policies of non-litigants, such as an industrial sector or the government, and can occur through several mechanisms.[30] One could think of the adoption of industry policy guidelines and the introduction and enforcement of regulation of industry by the government because of a court's ruling. Especially the effects of litigation on governmental risk regulation are interesting to note. In several jurisdictions, examples of governmental regulation *induced by* litigation are, according to some scholars, to be found in the context of asbestos,[31] tobacco,[32] air pollution,[33] weight-loss pills,[34] Halcion[35] and PFOA-chemicals.[36] Courts can, for instance, play an important role in overcoming information deficits and uncertainties about risks that paralyse(d) governmental action. Although courts themselves also face information deficits,[37] information on risks that are

[29] See also P Cane "Using Tort Law to Enforce Environmental Regulations?" (2002) 41(3) Washburn Law Journal 427, 433–435; AF Popper, "In Defense of Deterrence" (2012) 75 Albany Law Review 181, 185.

[30] Unfortunately, there is only thin empirical evidence available about the real behavioural effects of tort law in general and, particularly, in relation to specific behaviour of private actors and governments. This is partly due to the challenges empirical researchers face in establishing clear causal links between tort law and behaviour, and to filter out other relevant behaviour modifying factors (such as the availability of insurance and heuristic and biases). See WJ Cardi, RD Penfiel and AH Yoon, "Does Tort Law Deter Individuals?" (2013) 9 Journal of Empirical Legal Studies 567.

[31] Viscusi, supra, note 14, 3.

[32] P Luff, "Regulating Tobacco through Litigation" (2015) 47 Arizona State Law Journal 126.

[33] See Kysar in this special issue.

[34] W Wagner, "When All Else Fails: Regulating Risky Products Through Tort Litigation" (2007) 95 The Georgetown Law Review 693, fn 81 with further references.

[35] ibid [38] 711 fn 82 with further references.

[36] See, for an instructive overview, Viscusi, supra, note 14, and Morris, Yandle and Dorchak, supra, note 2.

[37] See section IV.

generated through legal proceedings and that would not have been available to the regulator otherwise, can lead to public and political condemnation of industrial practices and create an impetus for regulatory action. A well-known example in this respect is the regulatory effects of some of the tobacco litigation in the US. During this litigation, ultimately the misleading and fraudulent tactics of the industry to withhold information about the risks of smoking or even to actively disseminate information that falsely denied the existence of these risks became apparent. According to some scholars, this litigation influenced the political and public attitude towards smoking and the tobacco industry and led to public condemnation of the industries' practices. It resulted in more stringent regulation by US Congress.[38]

Last, judicial decisions can influence the behaviour and policies towards the risk that was central to the legal dispute but can also change behaviour related to other similar risks. Thus, under certain conditions, nanotechnology "producers" might draw lessons from asbestos case law. Important to note in this respect is that, if the activity that creates a risk is no longer carried out or the product is not on the market anymore, the behavioural incentives of a court's ruling are only present if there are risk general effects, ie when it is clear that the ruling applies to other risks.

4. Extra-judicial effects

The third regulatory feature is that, considering the previously discussed features, judicial decisions also affect the non-legal interests of third parties. In other words, court rulings have extra-judicial effects. For instance, the *Urgenda* judgment has implications for the Dutch energy supplies, as it requires a change of Dutch energy policies. Apart from such policy effects, one could think of influences on the availability and costs of insurance,[39] the availability of public funding for achieving policy objectives in case of public authority liability,[40] floodgate effects and the willingness of actors to bring new products to the market and implications of court rulings for product prices. Although some authors claim the occurrence of extra-judicial effects – some, for instance, argue that tort law's regulatory effects lead to risk aversion on the side of developers of innovative technologies with adverse impacts on innovation –[41] it is important to stress again that the empirical evidence about the occurrence of these effects as a *consequence of specific* court rulings is scarce. Nonetheless, as will be highlighted out below, courts do take such concerns into account.[42]

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[38] Luff, supra, note 34, 169. This, however, says nothing about the adequacy of these regulatory regimes. The point to make here is that they are (partly) induced by litigation.

[39] KS Abraham, "The insurance effects of regulation through litigation" in Viscusi, supra, note 2.

[40] K Oliphant, "The Liability of Public Authorities in Comparative Perspecive" in K Oliphant (ed.), *The Liability of Public Authorities in Comparative Perspectives* (Intersentia 2016) 860–861; Van Dam, supra, note 12, 531.

[41] For instance L Bergkamp, "Is There a Defect in the European Court's Defect Test? Musing about Acceptable Risk" (2015) 2 EJRR 309, 321, as a reaction to European Court of Justice 5 March 2015 (C-503/13, C-504/13), ECLI:EU:C:2015:148 (*Boston Scientific Medizintechnik GmbH/AOK Sachsen-Anhalt – Die gesundheidskasse en Beriebskrankenkasse RWE*).

[42] Section IV.3.

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III. Potential judicial and regulatory errors

1. False positives and false negatives

While judicial risk regulation occurs, and is recognised in both civil law and common law jurisdictions, the question remains whether, and if so how, civil courts could consider the regulatory effects of a given or an intended ruling. To answer that question, first the essence of deciding upon tort claims in the context of uncertain risks has to be addressed.

Central to judicial decision-making in the context of uncertain risks are the concepts of a false positive and a false negative. Both concepts relate to a wrong estimation of the existence, characteristic(s) and manageability of a risk.[43] In case of a false positive, one overestimates a risk and acts accordingly, but as it later turns out, due to a progressively more detailed understanding of the risk, the risk turned out not to be present or less severe than initially thought. When a false negative occurs, the risk is underestimated, while it later turns out that the risk does exist or is more severe than initially thought.

Tort proceedings are framed in the terminology of false negatives. In injunctive relief cases dealing with allegedly failing risk policies or management, the plaintiffs try to correct an alleged excessive focus by the defendant on the avoidance of a false positive and aim to direct the focus on the avoidance of a false negative. In claims for damages, victims seek compensation for a materialisation of a risk because of the defendant's alleged improper risk management, in other words, that he wrongfully let a false negative occur.

It is the court's task to assess the legal merits of the case and determine whether a false negative is likely to occur or occurred and the defendant is to be held accountable for it. The outcome of this assessment, of course, depends on the applicable legal rules on, among other things, the burden of proof, standards of proof, other rules of evidence, causation, and the relevant grounds for liability. Though, if the scope and application of these rules are unclear or the plaintiffs aim to stretch their boundaries, courts also have to decide upon the modification of legal concepts to decide the case.[44] Especially in that situation, courts might bear in mind the potential errors both for the litigating parties and, as a consequence of the regulatory implications of tort law, non-litigants. These involved errors can be summarised as follows:

- over-compensation;
- under-compensation;
- litigation costs;
- costs of implementing rulings into corporate and/or governmental risk policies;
- victims who are deprived of civil recourse;
- exposure to legal proceedings;
- the occurrence of undesirable extra-judicial effects (section II.2);

[43] See, on these concepts in the context of risk governance, SFH Hansen and JA Tickner "The precautionary principle and false alarms – lessons learned" in EEA 2013, supra, note 1, 21.

[44] R Posner, *Reflections on Judging* (Harvard University Press 2013) 54–55.

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– over-regulation, eg due to case law that amplifies too stringent norms and/or generates incentives that lead to excessive care;

– under-regulation, eg amplification of too low standards which might generate incentives for ostrich like behaviour in situations of risks and uncertainty;

– over-litigation/flood gate concerns;

– under-litigation, ie plaintiffs are discouraged by initiating legal proceedings because of inter alia low chances of success and legal costs;

– costs for the legal system, eg as a consequence of an increase of (ill-founded) claims.

2. Empirical and normative difficulties in evaluating tort's impact

Resolving the issue of false positives and false negatives involves both a normative and empirical issue.

Answering the normative question needs an analysis as to which of the potential errors one prefers (or better: seems to be the least problematic) on normative grounds. For instance, does one prefer the chance of over-deterrence or under-deterrence? And when do we find an increase in claims problematic, and for what reasons? The normative framework for answering such questions is, to my best knowledge, under-developed and requires an analysis of several legitimacy theories of judicial law making within tort law and their application to particular legal issues.[45]

The empirical question relates to either the ex-post evaluation of judicial decisions or to the ex-ante prediction of their potential regulation effects. With respect to the former, the empirical qualification of the results of litigation as either a false negative or false positive is often contentious. Scholars, for instance, argue that some litigation on Benedictin in the US gives an example of the occurrence of a false positive. According to them, the evidence of the harmfulness of these products presented during the litigation was based on inconclusive studies. Although mainly unsuccessful for the plaintiffs, the litigation nonetheless would have led to a flood of claims, raised legal costs above $100 million and resulted in the withdrawal of the respective products from the market.[46] Others, however, stress that the absence of conclusive scientific studies and evidence does not prove the safety of a product, and hence is not a valid reason for dismissing liability. They even argue that the US Supreme Court in its *Daubert* case law[47] accepted a too strict and ill-founded standard for the assessment whether the parties are allowed to

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45 This point was brought to my attention by one of the peer reviewers.

46 MD Green, *Benedictin and Birth Defects: The Challenges of Mass Toxic Substances Litigation* (University of Pennsylvania Press 1996) 242, 258–60; D Bernstein, "Getting to Causation in Toxic Tort Cases" (2008) 74 Brooklyn Law Review 51: R Haw, "Delay and Its Benefits for Judicial Rulemaking Under Scientific Uncertainty" (2014) 55 Boston College Law Review 331, 362–365.

47 *Daubert v Merrell Dow Pharmaceuticals, Inc* 509 US 579 (1993); *General Electric Co v Joiner* 522 US 136 (1996); *Kumho Tire Company Ltd v Carmichael* 526 US 1437 (1999); S Haack, "An Epistemologist in the Bramble-Bush: At the Supreme Court with Mr. Joiner" (2001) 26 Journal of Health Politics, Policy and Law 217–248; CF Cranor, "A Framework for Assessing Scientific Arguments" (2007) 1 Journal of Law Policy 7; CF Cranor, "The Challenge of Developing Science for the Law of Torts" in R Goldberg (ed.), *Perspectives on Causation* (Hart Publishing 2011) 262–281.

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present scientific evidence to the jury for proving causation. From their perspective, these standards for admitting evidence raise considerable hurdles for successful toxic tort litigation in general. The legal risk of scientific uncertainty and the risk of having the evidence rejected are consequently primarily borne by the plaintiffs,[48] which subsequently could lead to under-deterrence.

Analogously, a lack of empirical evidence about the extra-judicial effects of tort adjudication makes it difficult to *predict* the potential effects of an intended ruling. For example, in the context of nanotechnology contradicting arguments have been made about the behavioural effects of the threat of liability. Some argue that *less* liability provides an incentive for more precaution,[49] while others, on uncertain and unknown risks in general, favour a strict liability regime since it would provide actors with an incentive to do research.[50]

IV. Dealing with potential errors

1. Bipolar and multipolar risk reasoning

Bearing in mind the previous section, it becomes clear that when deciding upon a matter that involves uncertain risks, courts have to determine which party to the proceedings bears the risk of the potentially involved errors, and in the case of unclear law modify the applicable legal concepts accordingly. Courts could do so through bipolar and multipolar reasoning.[51] Bipolar reasoning, which is central tort law reasoning, relates to the allocation of risks and uncertainties and the potential errors between the litigating parties. To a significant extent this allocation is determined by the applicable procedural rules on the burden of production of evidence and the burden of proof, and the applicable substantive rules.

2. The (increasing) relevance of multipolar considerations

Under multipolar reasoning a court also takes regulatory effect into account.[52] Multipolar issues – or as Fuller and Winston call them, polycentric issues[53] – might be present in a case depending on among other things the litigated issue, the framing of the problem and the type of proceeding and the remedy sought.[54]

First, as Cane argues, judicial rule-making "by its very nature involves extrapolating from the particular to the general."[55] This characteristic of judicial reasoning especially

[48] CF Cranor, *Toxic Torts, Science, Law and the Possibility of Justice* (Cambridge University Press 2016); CF Cranor, *Tragic Failures* (Oxford University Press 2017) 100–135. See in general, on the pitfalls courts face when assessing scientific evidence, CF Cranor, "A Framework for Assessing Scientific Arguments" (2007) 15(1) Journal of Law Policy 7.

[49] D Dana, "When Less Liability May Mean More Precaution: The Case of Nanotechnology" (2010) 28 UCLA Journal of Environmental Law and Policy 153.

[50] MA Berger "Eliminating General Causation: Notes Towards a New Theory of Justice and Toxic Torts" (1997) 7 Columbia Law Review 2117.

[51] De Jong, supra, note 9.

[52] See, for critic on multipolar reasoning, E Weinrib, *The Idea of Private Law* (Harvard University Press 1995); A Beever, *Rediscovering the Law of Negligence* (Hart Publishing 2007).

[53] L Fuller and KI Winston, "The Form and Limits of Adjudication" (1978) 92 Harvard Law Review 353, 394–404.

[54] See also M Lee, "The public interest in private nuisance: collectives and communities in tort" (2015) 74 Cambridge Law Journal 329.

[55] Cane, supra, note 19, 329. Cane focuses on common-law rule making, but the same argument can be made for civil law jurisdictions.

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raises problems if the interests of non-represented groups are involved: "what courts have more difficulty doing is taking account of the interests of third parties who do not belong to either of the classes represented by the opposing litigants."[56]

Secondly, some legal proceedings are more "multipolar by nature". Proceedings such as collective redress for mass harm, test cases, public interest litigation and cases on public authority liability by nature transcend the interests of the litigating parties. The tendency to use private enforcement as a regulatory device and the increased possibilities of collective redress in mass torts in several countries, make it likely that civil cases by nature involve larger groups within society. Equally important in this respect is that some litigants, such as repeat players (eg insurers) and interest groups, initiate litigation specifically for reasons of its regulatory effects. For instance, in public interest litigation, the societal impact of litigation is often equally important to the plaintiffs as the legal implications of the verdict: their main aim is to change the *societal* status quo. Initiators of test cases also aspire to achieve clarity on the law or to stretch the boundaries of the law, among other things, to be able to adjust litigation strategies or to gain leverage to force an industry to change its behaviour. Besides, given the potential societal impact of decisions that relate to mass harms and the potential scope of such decisions, some scholars argue that courts cannot ignore the social consequences of their judgments in these situations.[57]

Third, as has been widely observed by scholars from the civil law and common law world, courts do already take regulatory considerations into account, especially if the applicable law is not clear and courts are engaging in law making.[58] In England and Wales, for example, policy-arguments play an important role in examining whether a duty of care has been breached.[59] In addition, in several countries courts considered among other things floodgate concerns and the consequences of public authority liability on government funding as a reason for reluctance in accepting liability,[60] used the potential deterrent effects of accepting variations on the theory of proportionate liability

[56] Cane, supra, note 19, 329.

[57] Eg J Spier, "Balancing Acts: How to Cope with Major Catastrophes, particularly the Financial Crisis" (2013) 4 Journal of European Tort Law 223.

[58] In the common law world there is a vivid discussion on the use of policy arguments by the courts. See J Bell, *Policy Arguments in Judicial Decisions* (Oxford University Press 1983) 26; P Cane, "Consequences in Judicial Reasoning" in J Horder (ed.), *Oxford Essays in Jurisprudence* (Oxford University Press 2000); K Burns, "It's not just policy: The role of social facts in judicial reasoning in negligence cases" (2013) 21 Torts Law Journal 73; C Witting, "Tort Law, Policy and the High Court of Australia" (2007) 31 Melbourne University Law Review 569; J Plunkett, "Principle and policy in private law reasoning" (2016) 72(2) Cambridge Law Journal 366; A Robertson, "Policy-based reasoning in Duty of Care Cases" (2013) 33 Legal Studies 119, who provides and overview of several kinds of considerations; N MacCormick, *Rethoric and the Rule of Law, A Theory of Legal Reasoning* (Oxford University Press 2005) ch 6, who observes that policy arguments especially play a role in "difficult" cases. See, for a Dutch discussion, J Spier, "Gedachten over een vastgelopen stelsel" (2014) Aansprakelijkheid Verzekering and Schade 6; ER de Jong and TE van der Linden, "Rechtspreken met oog voor extra-judicial effecten? Een bespreking van de mogelijkheden om rekenschap te geven van macro-effecten in het aansprakelijkheidsrecht" (2017) 2 Nederlands Tijdschrift voor Burgerlijk Recht.

[59] See J Stapleton, "Duty of Care Factors: A Selection from the Judicial Menus" in P Cane and J Stapleton (eds), *The Law of Obligations: Essays in Celebration of John Fleming* (Clarendon Press 1998) 59; C Witting, "Duty of Care: An Analytical Approach" (2005) 25 Oxford Journal of Legal Studies 33.

[60] Stapleton, supra, note 62, 76; Oliphant, supra, note 42, 860–863. For an English perspective, see H Wilberg, "Defensive practice or conflict of duties? Policy concerns in public authority negligence claims" (2010) 126 Law Quarterly Review 420.

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for justifying its acceptance,[61] and denied the applicability of the tort of public nuisance to societal risks on the basis of regulatory considerations.[62] In many instances, however, and perhaps as a consequence of controversy about the empirical validity of such concerns,[63] the exact meaning of these considerations remains under-expressed and hence camouflaged. Cane even argues that in the common law world multipolar reasoning is largely based on "untested speculation and intuition."[64] Similar arguments have been made in civil law jurisdictions such as The Netherlands.[65]

Considering the clarity, the transparency and acceptability of judicial law making, one justifiably can require courts to be at least explicit about the (legal) implications of these considerations.[66] Courts should reason either why regulatory considerations should be ignored, acknowledge that a regulatory argument does not rest on actual knowledge or why these considerations are instead a valid reason for denying or accepting liability.

When addressing multipolar considerations courts can operate with restraint and engage in minimalistic decision-making or embrace the regulatory effects of tort law and hence engage in "regulatory reasoning".[67] Minimalistic reasoning means that the court gives ruling upon the particular matter at hand and leaves as much as possible undecided, thereby limiting the legal scope of a specific decision, specifically about *and* because of the broader implications of that ruling.[68] This does not, however, mean that minimalistic decisions could not have regulatory relevance. While courts might not consider themselves to be the proper institution to evaluate the regulatory implications of a ruling, a minimalistic judgment can still bring attention to the need for risk regulation.[69] Minimalistic decisions, for instance, can signal towards the parties, the relevant industry or even the government the need for more sound information and research into the potential consequences of an intended ruling. When engaging in regulatory reasoning courts explicitly substantiate their verdict with regulatory considerations and the allocation of potential errors of a decision between third parties.

3. Bipolar restraints on multipolar reasoning

If they want to engage in multipolar risk reasoning, next to adjudicative facts[70] courts are also in need of social facts[71] and legislative facts[72] that place the dispute in its societal

[61] S Steel, *Proof of Causation in Tort Law* (Cambridge University Press 2015) 269, 371, 381. Steel refers to English, German and US cases. See also D Nolan, "Causation and the goals of tort law" in A Robertson and HW Tang (eds), *The Goals of Private Law* (Hart 2009) 165, 187–190; J Stapleton, "Cause in Fact and the Scope of Liability for Consequences" (2003) 119 Law Quarterly Review 388. See also *Gregg v Scott* [2005] UKHL 2, [2005] 2 AC 176.

[62] See section II.2.

[63] Wilberg, supra, note 63, 422.

[64] Cane, supra, note 61, 42.

[65] For references see De Jong and van der Linden, supra, note 61.

[66] See on transparency also Plunkett, supra, note 61, 366.

[67] Burns, supra, note 61, 100–104.

[68] C Sunstein, *One Case at the Time* (Harvard University Press 1999).

[69] Sunstein, supra, note 71, 4.

[70] Ie facts that are needed to decide the legal question at hand. J Monahan and L Walker, *Social Science in Law* (4th edn, The Foundation Press 1998). See also J Monahan and L Walker, "A Judges' Guide to Using Social Science" (2007) 43 Court Review: The Journal of the American Judges Association 156.

[71] That is, facts to place the adjudicative facts into the relevant social context, such as the occurrence and characteristic of a risk in the given and similar circumstances.

[72] That is, facts that are related to the potential regulatory effects of a specific decision, for instance effects on the insurability of a risk.

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and regulatory context. One should, however, bear in mind that the bipolar nature of tort law limits the availability of social and legislative facts. The perceived or even real presence of these deficits in a specific case subsequently determines (or better: restrains) the court's possibilities to consider multipolar considerations,[73] which can lead to empirical errors in the (multipolar) reasoning.[74]

First, the principles of party autonomy and judicial passiveness, that are central to tort law, bring with them that the litigating parties determine when to litigate, the subject matter of the litigation and the facts to consider.[75] In other words, civil courts are passive receivers of information and might, therefore, have limited knowledge, methods and tools to evaluate what the (regulatory) effects of a ruling are probably going to be for non-litigants.[76] While the parties to the proceedings have a strong incentive to bring forward adjudicative facts, the availability of social and legislative facts, of course, depends on the nature of the litigating parties (eg repeat players versus one shotter) and their interests and tools to generate such information. Some types of litigants, such as the single worker exposed to asbestos, might lack the tools, institutional support, and financial means to generate social and legislative facts.[77] Moreover, even if the parties present the social and legislative facts needed, they have a strong incentive to present and interpret this information in line with their interests. This can be troubling for courts if there are several valid ways of interpreting the information.

Second, most civil judges are legal generalists and do not necessarily have the qualification and specialisation to assess (complex) scientific information.[78] Consequently, they might have to rely on the parties and/or have to call for expert opinions to evaluate scientific information, for instance on the characteristic of the social context in which the risk is present (what is the chance of exposure to nanoparticles in several situations?).[79] This lack of official expertise can especially become problematic when there is no clear information available at all.[80]

Lastly, it is hard for courts to deal with multipolar issues in a systemic fashion.[81] Courts cannot initiate legal proceedings themselves,[82] which restricts their possibility to change legal norms appropriately. In addition, potential plaintiffs might lack the

[73] See also Cane, supra, note 19; DL Harowitz, *The Courts and Social Policy* (Brooking Institution Press 1977) 30–33, 35–38; Fuller and Winston, supra, note 55; M Shapiro, *Courts: A Comparative and Political Analysis* (Chicago 1981) 13; N Barber, "Prelude to the Separation of Powers" (2001) 60 Cambridge Law Journal 59, 76.

[74] See also Cane, supra, note 61.

[75] Cane, supra, note 19, 313; WH van Boom, *Efficacious Enforcement in Contract and Tort* (Boom juridische uitgevers 2006) 47.

[76] Cane, supra, note 19, 314–315.

[77] In some legal systems, the need for social and legislative facts can be met through the instrument of amicus curiae or, *inter alia*, third party intervention in disputes. Despite the availability of these mechanisms information deficits can, however, still occur. For example, a recent (empirical) Dutch study indicates that, although the Supreme Court judges and an Advocate General welcome the amicus curiae, they also observe that some organisations, such as consumer organisations, are under-represented as friends to the courts. I Giesen, F Kristen and ER de Jong (et al), *De Wet prejudiciële vragen aan de Hoge Raad: een tussentijdse evaluatie in het licht van de mogelijke invoering in het strafrecht* (Boomjuridisch 2016). Within the common law world, Kirkby signals a reluctance approach of courts in England and Australia to make use of these kind of mechanisms in the context of public interest litigation. M Kirkby, "Deconstructing the Law's hostility to public interest litigation" (2011) Law Quarterly Review 2529.

[78] Posner, supra, note 46, 54–55.

[79] See in the context of regulation vs. litigation Faure, supra, note 2, 693.

[80] Cane, supra, note 61, 41.

[81] See also C Witting, "Duty of Care: An Analytical Approach" (2005) 25 Oxford Journal of Legal Studies 33, 41.

[82] Van Boom, supra, note 78, 47.

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interests or resources to initiate proceedings, and even if they start proceedings, courts decide on a case by case basis. In the end courts might therefore move too slowly to keep up with the pace of changes in society that require changes in the law. Changes in the law might specifically be needed when scientific insights on a specific risk have changed and it becomes clear that the applicable rule is not adequate anymore, which particularly can be the case in situations of rapidly changing technologies. Whether courts can play a regulatory role in such circumstances, and hence update the applicable norms, depends on several parameters that influence the possibility and willingness of actors to initiate litigation, such as legal chances of success in court, litigation costs, rule on cost awards, recoverable damages and financial incentives to initiate proceedings,[83] and the level of organisation of interest groups. The presence and nature of these circumstances are for a considerable part influenced by the litigation culture of the relevant jurisdiction,[84] and civil courts are relatively limited at the controls of most of these parameters.

V. Distributing tort law's potential errors

1. Introduction

The remaining sections of this article aim to provide clarity on how tort law's regulatory implications, and information deficits thereof, could be appreciated in a specific tort lawsuit. The clarification will be given by discussing two legal challenges that arise in disputes involving risks and uncertainty.[85] The first issue relates to determining the required behaviour in a negligence-based claim. The second refers to the proof of a causal connection between the alleged wrongdoing and the incurred harm.

2. Uncertain risks and the required conduct

Under negligence-based claims, one has to assess whether the defendant took more risk than reasonably acceptable. According to Article 4:102 of the European Principles of Tort law this examination "depends, in particular, on the nature and value of the protected interest involved, the dangerousness of the activity, the expertise to be expected of a person carrying it on, the foreseeability of the damage, the relationship of proximity or special reliance between those involved, as well as the availability and the costs of precautionary or alternative methods."[86]

[83] Ie the financial bad and good chances of initiating a legal procedure, which are determined by the size and extent of the compensation available and obtainable (think of the possibility to obtain punitive damages), the applicable rules on costs awards, funding models for lawyers, and the actual availability of financial means to litigate.

[84] U Magnus, "Why is US tort law so different?" (2010) 1 Journal of European Tort Law 102, eg in the US interest groups are financially better organised than in The Netherlands. See also SL Cummings and DL Rhode, "Public interest litigation: Insights from theory and practice" (2009) Fordham Urban Law Journal 36, 603.

[85] MacCormick, supra, note 61, c 6; Robertson, supra, note 61, 119.

[86] See on this topic also Van Dam, supra, note 12, 234–258; D Howarth, "The General Conditions of Unlawfulness" in AS Hartkamp and others (eds), *Towards a European Civil Code* (4th edn, Wolters Kluwer 2011) 845. Variations are accepted in inter alia the US and Australia. See for the US Restatement (third) of Torts 2010; Liability for physical harm, § 3 and § 3 E to F; D Dobbs, The Law of Torts (Group West 2000) para. 145. For Australia see F Trindade and P Cane, *The Law of Torts in Australia* (5th edn, Oxford University Press 2012) 341 et sqq.

How these viewpoints work out in relation to uncertain risks is unclear,[87] and their application is particularly challenging if there is a combination of uncertainty about the existence of a risk and the effectiveness of preventive measures. In that instance, the question is whether an actor is reasonably allowed to engage in certain behaviour without knowing its potential adverse effects on the one hand, but often knowing that the behaviour has benefits on the other. Also, it comes down to the question whether the defendant is obliged to take a measure whose effectiveness is not (yet) proven. Accepting a duty of care in this situation involves the error of unnecessarily taking precautions. Denying it would mean that the victim potentially is deprived of his safety and possibly exposed to a risk. Paradoxically, a lack of scientific social facts and legislative facts makes it difficult to determine the chance(s) that one of each will occur.

The precautionary principle could give the normative framework for determining the required behaviour.[88] The principle has a negative and positive element. The negative element means that a lack of full scientific certainty about a risk is no valid reason for postponing (cost-effective) measures to manage these risks.[89] The positive element prescribes proactivity: when there is a plausible concern for the existence of a severe risk, operators that engage in uncertain risk behaviour should take precautions to avoid or diminish the possibility of harm.[90] The principle underlines the insight that the absence of scientific evidence of the existence of a risk cannot be seen as evidence of the absence of a risk, and resonates the idea that actors have to take responsibility for the adverse effects of the uncertainties about the risks created by their behaviour. Particularly in the course of an asymmetrical power relationship between the risk subject and risk creator and the appearance of the vulnerability of the risk subject one could embrace its application. When present, or perhaps merely when perceived, asymmetries as meant above provide the courts with good reasons and justifications to embrace the precautionary principle in a *specific* bipolar relationship.[91]

Still, the assessment of the potential regulatory effects of accepting the principle, is difficult due to a lack of clear scientific information about the risks involved. There is, however, a way to decrease the need for information but still amplifying norms and signal the legally-required way of dealing with the uncertain risk.[92] Courts could abstract from the complexity of a risk problem and determine the applicable responsibilities in rather general terms, for instance by embracing the precautionary principle and amplifying the precautionary norm that with the creation of uncertain risks, also responsibilities for the uncertainties arise.[93] As a consequence, courts attribute the risks of error as a result of a lack of information deficits to the defendant that is responsible for

[87] See eg J Spier, "Uncertainties and the state of the art: a legal nightmare" (2011) 14 Journal of Risk Research 501.

[88] H Cousy, "Risks and Uncertainties in the Law of Tort" in H Koziol and BC Steiniger (eds), *Tort and Insurance Law, European Tort Law* 2006 (Springer-Verlag 2008); Spier, supra, note 90, 501.

[89] Eg Principle 15 of the Rio Declaration on Environment and Development.

[90] See eg Dutch Scientific Council for Government Policy, *Uncertain Safety* (University Press Amsterdam 2009) 15.

[91] HR 25 November 2005, ECLI:NL:HR:2005:AT8782, *NJ* 2009/103, comm. I Giesen (*Eternit/Horsting*).

[92] Sunstein, supra, note 71, 4.

[93] It is important to stress that the foregoing does not mean that the defendant cannot escape liability at all; for example he could successfully challenge the existence of a generic causal relation. See also Cane, supra, note 19, 314.

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the "creation" of uncertainty, as it is then his responsibility to decide how to implement these notions of responsibility. From a regulatory perspective, one could favour this approach if (one assumes that) the defendant has more information about the risks and, *inter alia*, has more resources and possibilities for engaging into research at its disposal than the defendant (or the government) has. The point is that, although legislative information that shows the effectiveness of such a ruling is not available, the potential errors that ensue from this lack of information could be attributed to the defendant and are not necessarily a reason for judicial restraint.

3. Specific and generic uncertainty and cause-in-fact

Many (uncertain) risk of industrial society, such as asbestos, tobacco, climate change risks, and potential risks related to biotechnology and nanotechnology are characterised by a complex system of causal indeterminacy. Of these causal complexities, especially generic and specific causation uncertainty raise evidential challenges. Generic causation uncertainty refers to the existence of a risk *as such* and hence to the level of uncertainty about whether an act can cause harm at all. For example, can exposure to a nanoparticle cause cancer? In the situation of specific causation uncertainty, the question is whether, and to what extent, a specific act has caused a specific harm. Did exposure to asbestos cause the victim's cancer, or was it the victim's smoking? When faced with such uncertainties, tort law determines which of the parties have to overcome the evidential problems and hence bears the risk of not being able to prove a causal connection or to refute its existence.

The traditional test for examining cause-in-fact is the but-for test, which means that an examination has to be made whether the existence of the harm would have occurred but for the existence of the behaviour of the defendant.[94] However, under this test the plaintiff, who as a general rule bears the burden of proof, will not be able to prove a causal connection between the alleged wrongdoing and their harm due to causal indeterminacy and the accompanying evidential problems.[95] A false negative, ie no liability for wrongful risky behaviour, is the likely consequence and the tort system might lead to under-deterrence.

In many instances of specific causation uncertainty courts showed willingness to offer recourse against the wrongful behaviour by the defendant even though the exact consequences of that behaviour could not be proven. They did so by introducing mechanisms for partly attributing the evidentiary problems and the related risks of error to the defendant, such as the lowering of standards of proof, the introduction of evidentiary presumptions, reversal of the burden of proof[96] and the acceptance of the theory of proportionate liability and a loss-of-chance.[97] Courts endorsed variations on

[94] Van Dam, supra, note 12, 310–311.

[95] M Martín-Casals and DM Papayannis (eds), *Uncertain Causation in Tort Law* (Cambridge University Press 2016) and Steel, supra, note 64, 269, 371, 381. Steel refers to English, German and US cases.

[96] See, for a comparative overview, I Giesen, "The Burden of Proof and Other Procedural Devices in Tort Law" (2008) European Tort Law 49.

[97] The exact details of these legal theories differ per legal system. See I Gilead, M Green and BA Koch (eds), *Proportional Liability: Analytical and Comparative Perspectives* (De Gruyter 2013); Martín-Casals and Papayannis, supra, note 98, and Steel, supra, note 64, 269, 371, 381; Giesen, De Jong and Overheul, supra, note 23, 189. See, on the development of such theories in relation to risk, Dyson, supra, note 9.

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these theories with respect to several variations on specific causation uncertainties covering inter alia liability for toxic substances, environmental harm, medical liability and product liability.[98]

Bipolar reasoning gives a strong justification for the introduction of these mechanisms. The defendant's wrongful creation of serious health risks should not be left unsanctioned at the costs of the victim due to evidentiary problems.[99] As Nolan put it, the inadequacy of the traditional causation requirements for dealing with complex industrial risks should work "to the detriment of the negligent defendants rather than the blameless victim(s)."[100] Regulatory arguments could also be made to favour this approach.[101] Causation uncertainties undermine the plaintiff's chances of success in court which consequently also causes under-deterrence:[102] the defendants' wrongdoing is left unsanctioned and a signal to the relevant group of actors is given that their legal duties of care have limited practical relevance. Unsurprisingly, courts explicitly justified relieving the causation requirements by referring to the incentives they create for actors to confirm their legal duties.[103]

Some scholars question this stance on regulatory grounds, arguing that the boundaries of tort's flexibility are reached in the context of scientific uncertainty about risks. Their main point is that it would not be appropriate to loosen traditional causation requirements to distribute specific uncertainty elsewhere without thought,[104] risking opening the floodgates or creating negative economic effects, particularly if applied to systemic risks, such as climate change risks.[105] Accepting this argumentation requires either minimalistic decision-making or the overruling of established case law.

The justifiability of relieving causation standards in relation to generic causation uncertainties is more debatable. One might argue that generic causation uncertainties and the risks of error that come with them, should also be borne by the actor that is responsible for the activity that brought along these uncertainties.[106] The most far-reaching mechanism for implementing this idea is shifting the burden of proof to the defendant, who then has to prove that his behaviour was not capable of causing the harm at all or did not cause the harm in that specific case. For instance, a producer of nanoparticles then has to prove these particles do not impose (unacceptable) risks. The defendant, however, will be confronted with the same difficulties as the plaintiff when refuting the existence of a generic causal connection. Such a scheme thus would come close to liability without causation,[107] and for this reason will be at odds with the very fundaments of tort law.[108]

[98] See n 100.

[99] T Honoré, *Responsibility and Fault* (Hart Publishing 1999) 79.

[100] Nolan, supra, note 64, 172.

[101] I Gilead, M Green and BA Koch, "General Report" in Gilead, Green and Koch, supra, note 100, 43 et sqq.

[102] Nolan, supra, note 64, 187–190; see also J Fleming, "Probabilistic causation in tort law" (1989) 68 Canadian Bar Review 661, 662–663.

[103] Steel, supra, note 64, 269 and 371–381. Steel refers to English, German and US Courts.

[104] See in general Nolan, supra, note 64, 165–190.

[105] Spier, supra, note 60, 223.

[106] Eg Berger, supra, note 52, 2117–2153, 2217–2152.

[107] Martin-Casals and Papayannis, supra, note 98, 4; Nolan, supra, note 64, 189.

[108] This argument clearly makes sense when there is no scientific evidence for the existence of causation at all (unknown risks). The question is whether the argument holds in situations of uncertain risks, where there is an indication of a causal relation.

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Unlike cases involving specific causation uncertainty, where the causal connection between the risk and the defendant's wrongful behaviour is known in a generic sense, in situations of generic uncertainty the wrongdoing on the side of the plaintiff may not provide the justification for shifting the potential of errors to the defendant. Although the precautionary principle gives the normative framework for determining the standard of care in relation to uncertain risks, its relevance for examining causation and hence the distribution of damages is contentious, for at least three reasons. First, the principle's ethical foundation roots in a Kantian duty-based theory and does not touch upon liability mechanisms.[109] The ethic of precaution is primarily concerned with the protection of a vulnerable world against our potential to do catastrophic and irreversible harm, not with restoration or compensation.[110] Second, and subsequent to the preceding, its legal reception took place in areas of public law that are concerned with ex-ante risk regulation and management, and ultimately, the prevention of unacceptable harm, again not compensation. Third, the relevance of the principle for causation issues is contested because of its potential societal consequences.

Proponents of shifting the legal risks of generic uncertainty to the defendant would argue that it creates an incentive for deterrence in the context of uncertain risks.[111] Internalisation of the costs of generic uncertainty would create an incentive for actors to reduce the uncertainty or to take safety measures. In this way, tort law theoretically becomes an instrument to implement the precautionary principle and amplifies its rationale that actors should not be allowed to fully transfer the costs of uncertainty that come along with their behaviour to society and risk subjects. Others, however, stress the negative societal effects of this approach. According to them it would lead to an increase in ill-founded claims, raise considerable insurability issues and, lastly, leads to excessive care. Consequently, innovation would be hindered and slowed down, although one could argue that exactly this effect would be the goal of accepting the principle in this situation. It is difficult to assess these arguments on empirical grounds.[112] Nonetheless, the fact that generic uncertainty exists in relation to a wide range of situations,[113] gives some indications on the scope of such a ruling and the difficulties courts might face in delineating such a rule.

VI. Conclusion

Tort law plays a role in risk regulation. Consequently, while courts determine the liabilities and responsibilities between the proceedings parties, they might also be concerned with the regulatory implications of that decision, particularly in cases that

[109] H Jonas, *Das Prinzip Verantwortung* (Insel Verlag 1979); F Ewald, "The Return of the Crafty Genius: An Outline of a Philosophy of Precaution" (1999) 6 Connecticut Insurance Law Journal 47; F Ewald, "The Return of Descartes's Malicious Demon: An Outline of a Philosophy of Precaution" in T Baker and J Simon (eds), *Embracing Risk. The Changing Culture of Insurance and Responsibility* (University of Chicago Press 2002) 273–301; Cousy, supra, note 91.

[110] Cousy, supra, note 91, 18; COM (2000) 1 Communication on the precautionary principle.

[111] See in general, on the relationship between strict liability and the precautionary principle, Cousy, supra, note 91, 18. See, on this issue from a law and economic perspective, MG Faure, L Visscher and F Weber, "Liability for Unknown Risks. A Law and Economics Perspective" (2016) 2 European Journal of European Tort Law 198. See also the same issue of that journal for liability for uncertain risks and Spier, supra, note 90.

[112] See the end of section III.

[113] Particularly if the claim is negligence-based.

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are conducted for regulatory purposes or that most likely have a considerable legal and non-legal impact on non-litigants.

The foregoing discussion leaves us a complicated insight with respect to the way courts could take account of these regulatory effects and errors of tort law. On the one hand, the bipolar procedural framework of tort law potentially limits the courts' possibilities to assess regulatory concerns and hence to engage in risk regulation. Potential information deficits could undermine their possibilities to obtain a solid overview of the involved regulatory concerns. On the other, however, courts' decisions do have regulatory effects, which they occasionally do already consider. Viewing tort law from a risk regulatory perspective shows the crossroads at which it is currently standing and raises questions about the expectations one can have of courts as risk regulators. In some instances, courts can manoeuvre between these fields of tension, as has been illustrated in the last section, but a general framework of how to deal with regulatory concerns and with information deficits remains to be developed.

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