I. Financial Compensation in Case of Catastrophes: A European Law and Economics Perspective

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1. Introduction

Many countries seem to be victims of all kinds of catastrophes, whether these have a natural or a technological cause. Natural disasters are probably as old as man’s existence; technological disasters have increased as the apparently unavoidable price of technological progress. Depending upon the specific characteristics of the country, some are more faced with (various types of) natural disasters (earthquakes, volcanoes), whereas others have more problems with technological disasters (great fires, explosions). Nevertheless, some forms of natural disasters seem to threaten all countries. This seems especially the case for risks connected with the weather, like exceptional rainfall and flooding.
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The difference with before is that now legislators increasingly have the tendency to get involved with legislation in the prevention of and financial compensation for these catastrophes. It is particularly the latter aspect that will be addressed within the scope of this contribution. Victims nowadays apparently do not accept the old saying "the loss lies where it falls" and expect to be compensated for their losses in case a disaster has caused damage. When no tortfeasor who can be held liable is at hand and when no insurance coverage is available, victims will often turn to the government to claim some form of compensation. Given the large number of persons that can be victims as a result of a catastrophe, governments may have the tendency to respond to this request. This raises many interesting legal and economic questions. One of the obvious questions is under what circumstances an event will qualify as a catastrophe so that a special compensation regime will apply?

Generally one can understand the interests of various governments in this issue: a catastrophe can lead to a large number of persons affected, a lot of attention in the media and hence to an interest by politicians, who see that many voters are affected. For a single victim on the other hand it may make little difference whether one is victim as a result of a single victim event or as a result of a catastrophe, although the chances of special (financial) compensation by the government are larger in the latter case. Although there have already been many evolutions in various legal systems (more particularly concerning the compensation of natural disasters such as flooding) the events in September 2001 have lead to an increased interest in the role of government in providing compensation after catastrophic accidents. With September 2001 I not only refer to the well-known September 11 events, but also to the explosion that took place 10 days later in Toulouse (France) in the Grande Paroisse AZF factory that also killed 30 persons and injured 10,000.

In general there seem to be three different types of reactions as far as the financial compensation after catastrophes is concerned: a first possibility is that (in addition to liability law and social security which exists as a basic structure in every European legal system) no specific regulatory measures are taken. In those cases governments may provide additional compensation for victims in some cases on an ad hoc basis. That seems to be the case in e.g. Germany and Sweden. A second possibility is that a first party insurance solution is chosen. In this respect we do not refer to voluntary first party insurances that victims can of course take in all countries where these are available on the insurance market, but to regulatory interventions as a result of which coverage is mandatorily extended to include natural disasters. That is e.g. the case in France, will be the case in Belgium as a result of a recent legislative intervention and is discussed in both Germany and Italy. The third approach would be to have an outright compensation fund for victims of disasters that can provide for some amounts, although usually not full compensation (such as under tort law). Such a disaster fund exists inter alia in Belgium as a result of the Disaster Act 1976.
5 The various approaches chosen in some European legal systems seem to vary quite a bit. It seems interesting to analyse some of these solutions from a law and economics approach, since the general insights provided by law and economics can be quite helpful in analysing the efficiencies of various solutions and proposals. In this respect we can on the one hand rely on the broad law and economics literature on the law and economics of liability and insurance, although there is also some interesting literature on the demand for insurance protection against catastrophes. More recently some literature has also addressed the law and economics of compensation after catastrophes, but then more particularly in relation to flood insurance. However, most insights can already be gained from the mere application of the simple general principles of economics of liability and insurance to the case of catastrophes and that is precisely what this paper will attempt to do.

6 The paper is structured as follows: first some general principles will be recollected, that may be relevant for any system that would provide financial compensation after catastrophes (part 2). Next it will be indicated that whenever possible the system must be arranged in such a way that optimal incentives for the prevention of catastrophes are provided, by making optimal use (where possible) of liability (insurance) (part 3). Where liability (insurance) cannot provide compensation (e.g. in case of many natural disasters) first party insurance may, but the question arises whether additional government intervention is needed to make first party insurance work adequately (part 4). Even first party insurances may (especially when amounts are very high) not always provide an adequate solution; in those cases the question arises whether there should be a role for government intervention and if so which (part 5). The paper concludes with a summary (part 6).

7 This contribution of course does not aim to provide a final answer to all questions related to the financial compensation after catastrophes, but merely to indicate some possible instruments and the potential economic consequences that may be linked to them. In addition to providing an overview of possible legal and regulatory techniques that could be used to compensate victims of catastrophes, attention will also be paid to some solutions and evolutions in a few European legal systems. In that respect the reader should, however, be

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1 The classic book in this area is S. Shavell, Economic analysis of accident law (1987).
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aware that the legal situation in many European systems is today in full evolution and change and that moreover the situation may sometimes be highly complex. For that reason only a rough indication of the solution in some countries can be provided, where relevant, but of course no legal detail.

2. Starting Points

Before addressing in more detail various possible regulatory instruments to provide financial compensation after catastrophes it seems useful to recollect a few general starting points that result from the economic literature on liability and insurance. These should, based on that literature, play a role regardless of how a compensation system is to be structured.

a) A Few Economic Principles

First, as a general rule prevention should always precede compensation; a financial compensation regime should therefore primarily aim at providing incentives for the prevention of disasters, where possible.

Second, a compensation mechanism should be structured in such a way that principles of corrective justice are respected. This requires inter alia that those who created a risk also bear the financial consequences of it, but equally that those who run the risk should bear the costs of having risk removed from them.

Third, where possible, market solutions should be preferred. Hence, there is a preference for solutions whereby private parties (injurers and victims) can together with other parties (insurers) reach adequate solutions to obtain compensation. A preference for market solutions equally implies that, when a government intervention is necessary, this should preferably aim at facilitating market solutions rather than direct regulatory interventions.

b) Practical Consequences

These principles may have a few practical consequences when ideas are formulated on the legal structure of policy solutions for compensation, which can be formulated as a few indicators:

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Footnotes:

4 | This is more particularly the case inter alia in France where different regimes exist for natural disasters and for technological catastrophes, with various first party solutions, pooling, mandatory insurance and reinsurance through the state. To this complex system is then also added a specific compensation fund for victims of terrorism (see in this respect inter alia O. Moretteau/F. Lafay, France. Liability for acts of terrorism under French law, in: B.A. Koch (ed.), Terrorism, tort law and insurance. A comparative survey (2004), 29-56).

5 | These starting points can be found inter alia in W. Landses/R. Posner, The economic structure of tort law (1987); S. Shavell, Economic analysis of accident law (1987); but also in D. Dewees/D. Duff/M. Trebilcock, Exploring the domain of accident law; taking the facts seriously (1996), where these starting points are also tested on the basis of empirical findings.
First, it should be examined whether an actor can be found who caused the catastrophe and who can be made liable to provide the compensation. To guarantee this, solvency mechanisms should be put in place to avoid the judgement proof problem. In this way optimal incentives for prevention could be generated and a correct distribution could be achieved by laying the costs of the damage with the tortfeasor.

Second, where a liable (and solvent) tortfeasor cannot be identified, potential victims should be stimulated to take preventive measures themselves and provide *ex ante* security e.g. through insurance. Thus victims themselves finance *ex ante* their protection against future disasters. This solution is preferred to one whereby victims would be able to shift their losses to the community at large.

Third, in principle private solutions should be achieved and facilitated (where necessary) by the government. Collective solutions should only be strived for when private solutions fail.

c) Comments

Of course I realise that these starting points which are presented above without much explanation in a rather “quick and dirty” manner could be subject to discussion, although they seem rather straightforward and based on a good deal of common sense and – more particularly – consensus in the law and economics literature. They may, although indeed formulated rather simply, prove to be quite useful when examining the various regulatory solutions below. A few additional comments:

First, it should be remembered that from an economic perspective compensation of victims is as such not a goal of the legal system, but welfare maximisation through the minimisation of accident costs is. The question how victims of catastrophes can be provided compensation is in that strict sense not interesting from an economic perspective. However, given the fact that politicians tend to look for financial solutions that can compensate victims, law and economics can be a useful tool to indicate how a form of compensation can be provided at the lowest possible (administrative) costs and without unnecessary side effects (as far as affecting the incentives for prevention is concerned) or negative distributional consequences.

Second, in the starting points above we formulated not only criteria for the efficiency of the regime, but also criteria of corrective justice, *inter alia* aiming at the avoidance of negative redistribution. However, it should be realised that – as is often the case with debates about justice – these can be more heavily debated since they (at least partially) imply a policy choice: above it was made clear that an individualisation (self-protection) and insurance solutions against potential risks are preferred over a collective solidarity whereby risks are shifted to the collective. But others may well have totally different feelings about that particular choice.
3. Liability and Insurance

a) Importance

In this respect we can be brief: when a liable tortfeasor can be identified, tort law should be used to provide him with adequate incentives for prevention. This is the standard result of the economic analysis of tort law. If the tortfeasor can be held to compensate the damage he caused by the disaster, the goal of prevention will be reached and corrective justice is achieved since the costs are related to the one who created the risk.

Of course a debate could be held on the question whether in case of disasters tort law can be applied at all and whether a negligence or a strict liability rule should be applied. The availability of tort law will largely depend upon the cause of the catastrophe. Natural disasters are often caused by an “act of God”. The only liability that comes in the picture in this respect is a liability of the government e.g. for not taking adequate preventive measures or for inadequate warnings, e.g. in case of flooding. But in addition to this government responsibility the scope of liability law will be limited in case of natural disasters. This is different in case of technological disasters, which are usually “man made”. Moreover, several arguments have been formulated in the economic literature that a strict liability rule would be appropriate in case of ultra-hazardous activities (like running a nuclear power plant or a petrochemical company) which could exactly be the source of technological disasters. However, this literature equally indicates that strict liability is efficient only if the insolvency problem can be solved, otherwise it may lead to under-deterrence. Hence, from an economic perspective, strict liability should be introduced only if solvency can be guaranteed. This follows from the economic literature on the so-called “judgment-proof” problem, which indicates that insolvency of the tortfeasor will lead to under-deterrence. Therefore it has been held that compulsory liability insurance should be introduced in cases where the potential loss caused by the disaster may exceed the injurer’s assets. There is hence a pretty strong economic argument in favour of a duty to purchase financial coverage since the magnitude of the damage caused as a result of a disaster can easily outweigh the assets of the individual tortfeasor.

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b) The Law

21 When victims suffer harm as a result of a catastrophe, most of the personal injury damage will, in the European legal systems, be covered (although not completely) through social security. Victims will therefore only use tort law for the part of personal injury damage that has not been compensated through social security (usually pain and suffering and the top of the income loss which is not covered under social security). Property damage is also usually not covered under social security, but victims may have purchased first party insurance. In Europe tort law is therefore often used by subrogated (social) insurers who have first provided compensation to the victim. To the extent that these social security carriers effectively use tort law against injurers adequate incentives can still be provided. Nevertheless, given the high costs of these subrogative actions there is a tendency by (social) insurers in some countries not to use these rights of redress against injurers. That may of course lead to under-deterrence.

22 The extent to which tort law can effectively be used by accident victims (or their insurers) seems to play (at least implicitly) an important role in many legal systems, at least when one envisages the general structure of the law concerning financial compensation after catastrophes. Most legal systems make a clear distinction between on the one hand natural disasters and on the other hand technological catastrophes. Given the different role of tort law this may well make a lot of sense. Indeed, as we indicated, in case of natural disasters tort law will (with the exception of government liability) usually play a very limited role, which explains that in those cases other solutions are developed. In case of “technological” disasters liability law may well be the primary system, given that these are usually “man made”.

23 As far as the structure of tort law is concerned one can also – notwithstanding clear differences – notice a tendency in many European legal systems to introduce strict liability for technological risks.\(^{11}\) This seems to comply with the economic model. Nevertheless, there are still important differences as well.\(^{12}\)

24 In addition one can also note an increasing tendency to impose obligations to seek financial coverage upon potential injurers, although also in that respect important differences apply. For instance compulsory environmental liability insurance exists effectively only in Germany and Sweden.\(^{13}\) Compulsory liability insurance for e.g. the risk of fires in public places like discos and restau-

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\(^{11}\) For an overview see the contributions in B.A. Koch/H. Koziol (eds.), *Unification of Tort Law: Strict Liability* (2002).

\(^{12}\) The French/Belgian systems go quite far in that respect by accepting a strict liability for damage caused by defective “things” (on the basis of art. 1384, al. 1 of the Code Civil), whereas e.g. English law is far more restrictive in that respect.

rants does exist in Belgium, but not in the Netherlands. This led a Belgian commentator to the conclusion that if the dramatic fire in a disco in Volendam (the Netherlands) on New Year’s Eve in 2000 had occurred in Belgium, victims would have been largely compensated through the compulsory liability regime.\textsuperscript{14}

In sum, these mandatory solvency guarantees could be used at a much greater level to guarantee that the potential tortfeasor who causes the technological disaster can also meet his financial obligations.\textsuperscript{15} For instance in the Netherlands after the explosion of a fireworks factory in Enschede causing 19 deaths and 150 injuries on 13 May 2001\textsuperscript{16} the question was asked whether the licensee of such a factory should not be under the obligation to purchase some form of financial coverage, which was not the case when the explosion occurred.\textsuperscript{17}

However, even when solvency guarantees can be introduced to a larger extent and even when the amounts of mandatory coverage can be increased, this will still not be able to guarantee full compensation (and thus full deterrence) in all cases. This is of course the case when the catastrophe has not been caused by an identifiable injurer (mostly the case with natural disasters). Even when a liable injurer is fully (compulsorily) insured, the available amounts may still be insufficient to provide full coverage of the technological disaster. Hence, other solutions should be looked for to achieve both deterrence and (if one wishes) compensation of victims. As far as prevention is concerned, safety regulation is in the law and economics literature the logical reply to the inadequacy of tort law.\textsuperscript{18} Logically one can therefore find many regulatory interventions aiming at the prevention of catastrophes by imposing all kinds of regulatory duties and introducing licensing systems for risky activities. Since the scope of this paper does not focus on these regulatory preventative measures, but on the financial compensation, these will not be discussed any further here, but we will turn instead to other instruments that may provide victims with compensation, especially in cases where liability and insurance would fail to do so.

4. First Party Insurance

a) Potential

The blessings of various first party insurance schemes have been well described in economic literature. It has more particularly been argued that first party insurance schemes have the advantage that they allow a much better adaptation of the premium and policy condition to the risk and thus a better risk differentiation than liability insurance. This point has especially been advanced by Priest. But many other law and economics scholars have pointed at the advantages of first party insurance as well. One can now in various areas see an increasing tendency to move away from third party liability insurance towards first party or direct insurance schemes.

It is therefore no surprise that also many potential victims of disasters seek coverage through first party insurances. These can take the form of generalised accident insurance coverage or they can cover specific property damage. In most European legal systems the general accident insurance coverage provides coverage for specific costs that a victim would incur as a result of an accident. Depending upon the policy this can be lost income, coverage of (additional) medical expenses and in some cases even pain and suffering. These policies usually do not make a distinction as to whether the source of the accident is a catastrophe or not. Hence, well informed potential victims can purchase coverage according to their own degree of risk aversion and corresponding demand for insurance, of course assuming that competitive insurance markets offered those policies.

This was different in many European legal systems as far as the coverage for property damage is concerned. Many of these policies contained (at least in some countries) exclusions for property damage caused as a result of a natural disaster. This finding merits some further attention. The question more particularly arises whether there is a particular demand for these disaster insurances (no. 30), whether they are actually supplied (nos. 31–32) and whether there would be reasons for regulatory intervention (nos. 33–39). A few cases (nos. 40–42) and legal practice (nos. 43–45) should be discussed as well.

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22 This is more particularly the case in the French policy referred to as Garantie contre les accidents de la vie. This new insurance policy provides broad (first party) compensation against accidents and compensates as if tort law were applicable, therefore including compensation for pain and suffering.
b) Demand?

A first question that inevitably arises is whether there is actually a demand by the public at large for coverage against damage caused by catastrophes. First of all one should distinguish in this respect between personal injury damage on the one hand and property damage on the other hand. One could imagine that potential victims would especially be averse against the risks of personal injury. On the other hand they will probably not have many incentives to purchase additional first party insurance for this in those systems where personal injury is largely covered through the social security system. The latter is not the case for property damage, so that one would expect a larger demand for coverage against property damage, even if this were caused by catastrophes. The differences between the European legal systems in this respect seem, strikingly, to be quite great as will be indicated below. In some countries, such as e.g. in Germany, it was established as the result of a recent flooding of the Elbe in 2002 that only a very small percentage of victims had insurance coverage. This raised the question in German literature whether there would not be an adequate demand for these flooding insurances. The lack of adequate insurance coverage for damage caused by flooding is, so it is held, not a problem of a lack of supply but of a lack of demand. Endres/Ohl/Rundshagen have recently held that the lack of adequate insurance coverage may be the result of a lack of demand, because there would be no aversion against these flooding risks. They refer to psychological experiments that show that people may ex ante prefer uncertain losses than the certain loss by paying the premium. Kunreuther showed this more particularly also concerning the decision to purchase insurance against the risk of flooding. The problem, according to this literature, is that ex ante the potential victim (like a house owner) is confronted with the certain loss of a premium, whereby the expected damage in case of flooding can only be estimated and therefore constitutes an uncertain loss. Endres/Ohl/Rundshagen rightly indicate that whether there is risk aversion against disasters such as e.g. flooding should of course be the subject of further empirical research. Anyway they stress the point that it is too easily accepted (at the policy level) that there is risk aversion, whereby this may not always be the case. In the latter case, the lack of demand could simply explain the lack of the existence of flood insurances e.g. on the German market.

14 See A. Endres/C. Ohl/B. Rundshagen (supra fn. 3), 289.
16 See H.C. Kunreuther (supra fn. 2) and F.J.H. Schoemaker/H.C. Kunreuther (supra fn. 2), 603–618.
c) Supply

31 Even though it is – as just indicated – questionable whether there is a high demand for the insurance of the consequences of catastrophes like e.g. flood, there are definitely problems on the supply side as well. For instance in the Netherlands in the 1950s the Dutch insurers' association issued a so-called "binding decision" on all of its members, prohibiting them from insuring flood and earthquake risks (the latter being relatively small in the Netherlands with the exception of the area around Southern Limburg). Their argument was that these risks were technically not insurable and that therefore its members should all refrain from covering them. The arguments concerning the uninsurability seem highly doubtful, as we will indicate below, but they also clearly violate competition law. At the time a Commission Regulation number 3932/92 of 21 December 1992 exempted many cartel agreements in the insurance world from the prohibition under the old art. 85(3) of the EEC Treaty, provided that certain strict conditions were met.\textsuperscript{28} This exemption was heavily criticised by law and economics scholars, who argued that competition policy should be fully applied to insurance markets as well.\textsuperscript{29} The binding decisions not to insure flood and earthquake risks not only clearly limits supply (it effectively excludes it as a result of a cartel agreement), but it also clearly violates the conditions of regulation 3932/92. Consideration 8 preceding the exemption clearly states that standard policy conditions may in particular not contain any systematic exclusion of specific types of risk without providing for the express possibility of including that cover by agreement. This is repeated in art. 7(1)(a) of the exemption. The Commission also issued a report to the European Parliament and to the Council on 12 May 1999 on the functioning of the exemption regulation number 3932/62.\textsuperscript{30} In this report the Commission explicitly discusses these so-called binding decisions.\textsuperscript{31} The report states that as a result of the questions asked by the Commission, the Dutch Association of Insurers decided to bring its binding decision into line with art. 7.1 sub-§ a, by simply converting it into a non-binding recommendation, leaving each insurer free to extend cover to flood risks.\textsuperscript{32} Without going into this in further detail this Dutch example clearly shows that a lack of supply of insurance coverage may well be the result of anti-competitive behaviour by insurers, who mutually agree not to cover particular catastrophic risks.\textsuperscript{33}


\textsuperscript{30} \textit{COM}, 1999, 192 final.

\textsuperscript{31} See Report number 18, 9.

\textsuperscript{32} For further details see M. Faure/T. Hartlief (supra fn. 15), 222–225.

\textsuperscript{33} Now this issue is dealt with by Commission regulation no. 358/2003 of 27 February 2003 on the application of art. 31(3) of the treaty to certain categories of agreements, decisions and concerted practices in the insurance sector, OJ, L53/6 of 28 February 2003.
At the policy level this shows that a first condition for insurability of catastrophic risks is of course a competitive insurance market that offers a wide variety of differentiated insurance policies as a reaction to a corresponding demand. Instead of a direct government intervention, the first adequate reaction of government should therefore be to guarantee an adequate competition policy, also with respect to insurance markets. Otherwise uninsurability may, as the Dutch case shows, simply be the result of a cartel agreement.

d) Compulsory Insurance?

Assuming that citizens are averse against the risk of damage caused by certain catastrophes and hence have a demand for adequate coverage against a fair premium in a competitive insurance market, the question arises what regulatory intervention should be taken if insurance coverage nevertheless fails. The classic economic rationale behind compulsory (liability) insurance was the externality argument presented above: in the absence of adequate insurance insurers could (through their insolvency) externalise risk. As we indicated that may be an argument in favour of compulsory liability insurance.\(^{34}\) However, that argument is not very convincing in the case of first party insurance. One could still argue that victims who were not adequately insured for personal injury would then extensively call on the healthcare system and thus “externalise” that risk. But given the fact that most European legal systems provide (through social security) wide coverage for healthcare (precisely through mandatory healthcare insurances) one cannot see why that should be supplemented with an additional compulsory accident insurance. The same is true for the property damage that victims may suffer as a result of a (natural) disaster. Of course the absence of insurance may lead to additional calls from victims for collective help (and as a result of political pressure caused through the large number they may succeed), but there is as such no direct issue of externalisation of their harm.

The second traditional economic argument in favour of compulsory insurance would be information problems. This would assume that citizens are averse against the risk of large damage as a consequence of catastrophes and would be willing to pay a premium to have that risk removed from them, but simply do not purchase insurance because they lack information e.g. concerning the probability and magnitude of the risk and/or on the availability of insurance. Regulation would then be the classic remedy to cure an information deficiency.\(^{35}\)

This could constitute an argument in favour of compulsory (first party) insurance e.g. for property damage caused as a result of natural disasters if empirical evidence showed that victims would greatly underestimate these risks and would, being well informed, definitely have a demand for insurance. If these

\(^{34}\) See supra 3.a).

conditions were not met, a regulatory intervention forcing potential victims to take out insurance coverage would amount to mere paternalism.

36 There are, however, various drawbacks to such a duty: first, if a general duty to purchase “disaster coverage” were to be introduced for all victims there may be disadvantages for those victims who do not run any risk. Take the example of flood insurance: one can imagine that a person living in a house close to a river might have a demand for flood insurance, but the same is probably not true for someone living in an apartment in a city on the 11th floor. A generalised duty to purchase insurance coverage would therefore force all individuals to take insurance coverage, even those that run no risk at all and therefore have no demand for insurance. This could thus create inefficiencies and lead to a negative redistribution whereby those who run no risk would have to contribute to the premium of those who may actually benefit from the insurance coverage. A more efficient solution may therefore be the one whereby the compulsory coverage (e.g. for flood risks) is limited to those individuals who actually are exposed to the particular risk.

37 Second, economists have always warned that introducing a duty to insure may be efficient only if sufficient competition in the particular insurance market exists. Otherwise the introduction of a duty to insure creates a dependence upon the insurance market whereby the (concentrated) insurance market can de facto decide under which conditions to sell its product. Obviously, in a monopolistic market compulsory insurance will create inefficiencies.36

38 The third issue one always has to realise is that some particular catastrophic risks may be so new that insurance markets may not yet have developed to cover them. If a differentiated offer of insurance policies is limited, one could again question whether it makes sense to introduce mandatory insurance if such coverage could only be found to a limited extent (or without sufficient competition) in private insurance markets.

39 Above it was questioned whether there is an adequate demand for disaster insurance.37 But even if there is such a demand it is not always guaranteed that insurance cover will automatically be available. If initially too few actors have a demand for insurance, adverse selection may arise and optimal risk spreading may not be possible. Thus, at the policy level, it should be clear that competitive insurance markets are willing to offer the particular disaster insurance products before a duty to provide coverage is introduced.

36 It has, for instance, in relation to environmental insurance, also been indicated that if one makes the availability of insurance coverage a prerequisite for the operation of an enterprise, insurance undertakings become the de facto licensor of the industry. This may especially be problematic from a policy perspective if this happens on concentrated insurance markets. See A. Monti (supra fn. 71, 65).

37 See 4.b).
e) Application: Flood Insurance

Some of the issues that play at the policy level in case of first party disaster insurance can nicely be shown by the discussions that took place in this respect in the 1990s in the Netherlands. As we indicated above originally the Dutch insurers' association had effectively excluded supply by prohibiting the Dutch insurers from covering flood and earthquake risks. After the cartel agreement collapsed (as a result of European pressure) a debate emerged on the structure of flood insurance. Dutch insurers argued that disaster insurance entails a great risk of adverse selection, meaning that only bad risks will purchase insurance coverage. In order to make the risk insurable, so it was held, also good risks should be covered. This could only be reached if disaster insurance (in casu for flooding) were made compulsory. If good risks were also forced to purchase insurance coverage, adverse selection could be avoided.

As a result of these discussions a proposal was introduced to force every person who has a household insurance to mandatorily also purchase coverage against flooding. The Dutch Council of State voiced serious criticism of this proposal, as a result of which the whole bill was withdrawn. Interestingly enough the Council of State inter alia argued that it would also be wrong to let people who run no risk at all pay for the additional coverage.

This is indeed a crucial issue that merits some further attention in relation to the insurability of the disaster risk. The remedy against adverse selection is of course a pooling of risks whereby the insurer should have both good and bad risks. However, the Dutch insurers wrongly suggested that the disaster risk would only be insurable if everyone, even those who run no risk at all, were forced to purchase insurance coverage. A proposal whereby every citizen, even those living in an apartment on the 20th floor would be forced to take out additional coverage for the risk of flooding clearly creates a negative redistribution. Adverse selection can also be avoided if only those who are exposed to the risk are forced to take the mandatory coverage. Otherwise persons would be forced to pay for insurance for which they have no demand at all, simply because they are not exposed to the risk. Within the group who is actually exposed to risk (and presumably has a demand for insurance) an adequate differentiation of risks and premiums, as a remedy to adverse selection, is possible.

f) The Law

The most well-known example of mandatory first party insurance is probably the French model according to which all individuals who have taken out first party property damage insurance policies have to pay a supplementary premi-

38 For further details see M. Faure/T. Hartlief, Nieuwe risico's en vragen van aansprakelijkheid en verzekering (2002), 183–189.
39 This was – as we will explain below – based on the French example of the coverage against natural disasters.
um for a mandatory coverage for natural disasters. Hence, France does not have a generalised duty to insure, but a compulsory complementary coverage on (voluntary) property damage contracts. However, those property damage policies are widespread and all individuals who purchase such a policy have to pay for the additional coverage for natural disasters. This system is apparently accepted in France, because the risk of negative redistribution is small: France seems to be confronted with many types of natural disasters. This means that if one is presumably (as an inhabitant of an apartment on the 12th floor) not exposed to the risk of flooding, one may be exposed to other natural disasters, such as earthquakes or the result of heavy storms.

Belgium equally moved to a similar model: Belgium had a compensation fund for disasters since 1976; as a result of a legislative change in May 2003 (which has not entered into force yet) a compulsory flood coverage in addition to the voluntary property damage insurance contracts has been introduced. It looks like the French system, but the major difference is that this mandatory supplementary coverage would only apply for certain risk areas. This would hence avoid a negative redistribution because those who are not exposed to the risk are not forced to take out the coverage. In Italy and Germany legislative initiatives are under discussion at this moment, equally aiming at some form of mandatory coverage against damage caused by disasters.

Note, moreover, that in France as a result of the explosion in Toulouse on 21 September 2001 a legislative change was effectuated in July 2003 as a result of which victims now also have additional compulsory coverage for damage caused by technological risks (such as the explosion in Toulouse). That latter solution is, however, debated (also in France). It is not so clear why in this case of technological disasters, where a liable wrongdoer can be identified, a mandatory coverage for victims was introduced rather than examining the introduction of solvency guarantees on the side of the wrongdoer, such as compulsory liability insurance.

g) Outlook

In sum, there seems a clear tendency in many European legal systems towards some form of compulsory coverage of the consequences of disasters on a first party basis. This tendency could on the one hand be criticised from an economic perspective since it is not sure that there is an effective demand for such

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41 The supplementary coverage for disasters is financed through an additional premium of 12% on all property damage insurance contracts. See for a description and critical analysis of this French model also R. Schwarze/G. Wagner (supra fn. 3), 16–17.
42 The same point is made by Schwarze and Wagner: if previously distinct risks are pooled (like flood, windstorms and hail) individual exposure to some risk would almost be guaranteed (R. Schwarze/G. Wagner (supra fn. 3), 12).
43 Through the charging of exposure-related premiums “cross-subsidization” between various areas could be reduced (R. Schwarze/G. Wagner (supra fn. 3), 12).
44 Again it is a mandatory coverage for damage caused by technological disasters on voluntary insurance contracts.
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a coverage in all cases. However, this problem can at least be reduced (see the example of the legislator change in Belgium in May 2003) if the duty to obtain coverage is limited to those individuals actually exposed to the risk. This enables on the one hand an adequate risk differentiation and avoids persons being forced to purchase coverage for which they would have no demand. It can also avoid a negative redistribution. Even though these regulatory interventions can be questioned from an economic perspective one should realise that politicians will (given the high number of voters involved) always tend to provide some form of compensation after a large number of victims is affected by a disaster. In that respect the solution of some form of mandatory coverage for those who actually run the risk seems better than ad hoc solutions whereby public means are randomly used to compensate victims. Insurance at least ensures that victims themselves pay for the protection they will afterwards obtain and moreover through an adequate risk differentiation first party insurance may have some preventive effects.47 Thus the mandatory coverage for disaster risks seems a better regulatory solution whereby the government relies on the insurance market to provide this coverage. All of this, however, assumes that coverage can be made available via competitive insurance markets. If that condition is not met, making insurance compulsory would be a bad policy option. In this respect a problem arises with the French/Belgian solution from the angle of competition law: in that case insured who purchased property damage contracts are also forced to take the mandatory coverage for disaster insurance. This so-called tie-in agreement, forcing a consumer to buy a specific service/product together with another product, may well violate the conditions of the exemption agreement concerning the application of competition law to insurance markets. On the other hand an outright duty to purchase disaster insurance for all citizens may be hard to enforce. This is hence an issue that definitely merits further research.

If such a system of mandatory coverage is in place, one could assume that this should be able to provide adequate compensation. However, that may not always be the case when extremely large losses occur. The amount of the damage caused can sometimes be that high that it outweighs the possibilities of an individual insurer or of the national insurance market altogether. The question then arises whether additional public intervention is indicated.

5. Public Intervention

a) Government as (Re)Insurer or Santa Claus?

Government intervention in case of financial compensation after catastrophes can take different forms. The most modest form is, in addition to providing regulation for the prevention of disasters, to impose – as indicated – where

47 In the sphere of flood insurance one can think of risk differentiation whereby good risks would take adequate preventive measures are rewarded with lower premiums or bad risks (those who chose to construct a house near to a river) are punished with a higher premium. See also R. Schwarze/G. Wagner (supra fn. 3), 14-15.
warranted a duty to purchase (third party or first party) insurance coverage. The intervention could go much further where the government itself provides, for example, via a fund, compensation to the victims of catastrophes. Another alternative would be to let the government itself act as reinsurer for larger risks.

49 There is no clear unanimity in the economic literature on which of these two is the better solution. Chicago law and economics scholars Gron and Sykes are relatively critical as far as a role for government as reinsurer is concerned. They argue that it would be unjust when the government would provide (re)insurance at a lower price than the market. This would also give a wrong signal to the market as far as stimulating insurability is concerned. They are – remarkably – in favour of ad hoc solutions whereby compensation is provided to accident victims on an ex post basis. This at least would not give market participants the impression that the government will anyway guarantee a compensation. Dutch lawyers Ammerlaan and Van Boom have also, on the occasion of the decision of the Dutch government to participate in a reinsurance against terrorism, formulated heavy criticism: they argue that the premium that would be demanded would not be the correct market premium. Moreover, they argue that it should not be the task of the state to provide private insurance. Damage caused as a result of terrorism, so they hold, should be financed through the public purse.

50 Notwithstanding these criticisms there are many examples where states act as reinsurer or at least provide some guarantee of a last resort. This phenomenon is of course not new. Already in the nuclear liability conventions of the 1960s a compensation system consisting of various layers was introduced whereby a part of the damage is paid by the liable licensee of the nuclear power plant, a second layer by the state and a third layer by all contracting parties. After 11 September 2001, when airline risks became more difficult to insure, the US federal government also guaranteed insurance coverage. Similarly in Germany a reinsurance company called Extremus was founded to cover the terrorism risk with a state guarantee for amounts above € 3 billion and until € 10 billion.

46 Assuming of course that any government intervention is warranted at all; it was already indicated above that from an economic perspective victim compensation is as such not a goal of accident law. However, given the political needs and pressure it can be examined what the most effective role for government may be, given the desire to provide some form of compensation.


50 For further details see K. Abraham, United States of America. Liability for acts of terrorism under US law, in: B.A. Koch (supra fn. 4), 176–188.
A similar model was also recently introduced in the Netherlands where a reinsurance company for terrorism damage was founded, being the Dutch reaction to 11 September 2001. This Dutch reinsurer supports a strong form of intervention by the state through reinsurance. For a longer time now the French Caisse Centrale Réassurance (CCR), which provides reinsurance via the state and even provides for unlimited coverage (in reinsurance) for natural disasters and technological risks has also existed in France.

The critical attitude of economists and some lawyers hence does not correspond with legal reality. The question indeed arises whether a model of reinsurance guaranteed by the state is as bad as suggested. When the capacity on the private insurance market is too limited (which may indeed be the case when the amount of the damage resulting from a catastrophe is large) reinsurance by the state seems an adequate method to facilitate insurability. In that case the government supplements the markets where insurance capacity fails. On the condition that the government charges an actuarily fair premium for its intervention there seems to be hardly any objection to this. Moreover such an intervention seems to be preferred in comparison to collective solutions like funds sponsored through the public purse. When the government acts as reinsurer this at least has the advantage that a premium can be paid by those who actually cause or run the risk. This type of government intervention thus facilitates market solutions and respects distributional principles. The argument by Gron/Sykes that ad hoc funds would be better than a reinsurance is also hardly convincing: it is particularly these ad hoc solutions upon which victims will always depend that may provide the wrong signal to market participants. Of course such a state intervention as reinsurer should still leave freedom with the individual insurer to use the possibility of this state-reinsurance or not. A duty to call on the state-provided reinsurance might again endanger competition in insurance markets.

b) Funds or ad hoc?

When the government does not act as reinsurer but (as suggested by Gron/Sykes) should provide compensation through the public purse, the question arises first of all whether a structural arrangement should be put in place or whether ad hoc solutions should be preferred whereby the government decides, depending upon the size of the catastrophe, whether public funds will be made available or not. Here again the economic and legal approaches seem to differ. Gron/Sykes' argument about providing a wrong signal definitely applies to a structural fund. If market participants were aware that in case of a catastrophe the financial consequences would be covered through government intervention, this would provide them with few incentives to develop financial

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31 Nederlandsche Hervezekeringsmaatschappij voor Terrorismeschade.
32 For further information on this CCR see http://www.ccr.fr.
33 This point of view is equally supported by R. Schwarz/G. Wagner (supra fn. 3), 13–14.
solutions themselves. Endres/Ohl/Rundshagen clearly indicate that a compensation by the state dilutes any incentive to “self-insure” by the victim or to take preventive measures in the framework of an effective risk management. Those who can be certain that they will be compensated by the state can keep the insurance premium in their pocket and hence free ride on the state, so they correctly hold.\textsuperscript{55} They equally correctly indicate that if the state simply provides full compensation \textit{ex post} this will dilute any \textit{ex ante} preventive effect that one would normally expect with differentiated insurance premiums.

Lawyers on the other hand stress that the \textit{ad hoc} solutions create legal uncertainty. For one catastrophe an \textit{ad hoc} solution may be introduced, but for another not. German scholars, for instance, hold that the German legislator provided very generous compensation for the victims of flooding through the so-called \textit{Flutopferhilfesolidaritätsgesetz} after the 2002 Elbe-flooding, but that this on the other hand creates a great inequality vis-à-vis other victims of catastrophes (or other accidents!) where this \textit{ad hoc} generosity does not apply.\textsuperscript{56} The disadvantage is not only the possible violation of the equality principle in applying \textit{ad hoc} solutions,\textsuperscript{57} but also that the procedures, amounts of compensation etc. will be different for every \textit{ad hoc} case. Lawyers therefore plead, in the interest of victims, for a uniform and structural arrangement, so that victims know whether they can be entitled to compensation after a catastrophe.\textsuperscript{58} And it is of course precisely that certainty that economists would like to avoid, since it dilutes any incentive to develop adequate market solutions.\textsuperscript{59}

This difficulty indicates once more that it might be more warranted to first look for (mandatory) coverage of disasters through insurance, eventually supplied with reinsurance through the state. If that functions adequately \textit{ad hoc} or other structural solutions (with all of their difficulties) could be avoided. Indeed, the law and economics literature is generally not very enthusiastic con-

\textsuperscript{55} A. Endres/C. Ohl/B. Rundshagen (supra fn. 3), 290. A similar point has also been made by Epstein who equally claims that the incentives to insure against disaster losses will be diluted in case of government relief (R.A. Epstein (supra fn. 2), 287–308 and R. Schwarz/G. Wagner (supra fn. 3), 10).


\textsuperscript{58} See for instance also K. Ammerlaan/W. Van Boom (supra fn. 48), 2336 and R. Schwarz/G. Wagner (supra fn. 3), 11: They argue that the concept of the welfare state essentially demands that anyone in serious difficulties be provided government assistance. That point may well justify social security systems (covering lost income and health care expenses), but it is highly questionable whether that also justifies public interventions for property damage.

\textsuperscript{59} Schwarz and Wagner rightly indicate that here one discovers that crucial difference between the economic and the legal approach: law and economics would suggest to deny all help to individuals living in risky areas to provide them incentives to develop insurance solution themselves (R. Epstein (supra fn. 2)), whereas this strategy would probably be incompatible with the concept of the welfare state as this applies to most EU Member States, so they hold (R. Schwarz/G. Wagner (supra fn. 3), 10–11).
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cerning the use of compensation funds. Although the literature is rather scarce in this respect, it is usually indicated that there are not many reasons why, if both insurance and funds were in theory available, a compensation fund would provide better protection against insolvency than private insurance markets. Insurance, so it is generally held, better enables an adequate risk differentiation and risk spreading and if insurance markets are competitive, insurers can be assumed to be better able to deal with classic insurance problems such as moral hazard and adverse selection than the administrators of a compensation fund. A compensation fund therefore only comes into the picture if insurance may not be able to provide coverage for certain risks. But as indicated earlier, the preferred solution would be first to examine whether the functioning of insurance markets could be facilitated.

c) Compensation Funds: Economic Prerequisites

Although it follows from the above that in the economic analysis of law there is little enthusiasm for compensation funds (and a preference for insurance) a few indications could be given on how such a fund should be shaped, if instituted at all.

First of all it seems important that a fund should have a subsidiary character, meaning that whenever other solutions are available (tort law or insurance), victims should be forced to use these first. Thus at least some guarantee can be given that incentives will be safeguarded by victims to look for other solutions and not merely free ride on the fund. Obviously such a “subsidiary character” will be more important when a third party can be held liable (as with technological disasters) than when no liable party can be indicated (as with natural disasters). Moreover, the mere existence of the fund can, as was rightly indicated by Endres et al., dilute the incentives to develop insurance solutions. Therefore the requirement that if insurance is available this must be used first, may not mean a lot in practice where structural funds exist. Indeed: why should the potential victim pay a premium for insurance coverage if there is certainty of an ex post payment through the public fund?

Second, if nevertheless a payment is made through the compensation fund, the fund should be subrogated in the rights of the victim against potentially liable third parties. Indeed, it may be that for political reasons (or out of pity for the victim) the fund manager does not consider it reasonable to expect from the

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victim first to use the liability system.\textsuperscript{62} If in those cases compensation is paid notwithstanding the potential of a claim in tort, the fund should be subrogated in the rights of the victim in order to provide adequate incentives for prevention to the wrongdoer.

58 \textit{Third,} as far as the financing of the fund is concerned, this should ideally be organised in such a way that those who contributed to the risk also finance the compensation fund. With technological disasters this ideal might still (partially) be realised e.g. through a tax on risky activities. However, in many cases of catastrophes there are no identifiable wrongdoers or contributors to the risk. In those cases it is merely a political question if one wishes to let potential victims themselves partially pay for their compensation or whether one prefers a national solidarity solution through the public purse. For instance, in case of flooding (assuming that one rejects an insurance solution), one could imagine that a potential compensation fund would be financed especially by those who are particularly exposed to the risk of flooding. That may well be the indicated solution from a corrective justice perspective. However, as we indicated above, people may have different views on that. Some will consider it a matter of national solidarity that victims of (natural) disasters are compensated and in that case they will require financing of the fund through the public purse, meaning that the consequences are redistributed via all tax payers.

59 Finally, in order to keep at least some incentives with potential catastrophe victims, it seems important that the compensation fund does not provide full coverage, so that victims themselves are still partially exposed to the risks. This is – as well-known – one of the classic remedies against moral hazard.\textsuperscript{63} This could be reached either by applying a deductible, or by applying standardised forms of compensation (which are usually lower than full compensation).

d) The Law

60 As indicated in the introduction, the (European) experiences with compensation funds for catastrophes are quite diverse. Countries like Germany, the Netherlands and Sweden have no structural compensation fund, but usually work with (rather generous) \textit{ad hoc} solutions. These \textit{ad hoc} solutions show all of the disadvantages indicated by lawyers. For instance in the Netherlands \textit{ad hoc} compensation funds were set up after an infection by legionella, after a fire in a disco in Volendam and after an explosion of a fireworks factory in Deventer (the last two occurred in 2000). Although there are some similarities, the procedures and amounts awarded do differ. In Germany a specific fund was erected after the large flood of the Elbe in 2002 which paid out almost € 2 billion in compensation. Formally the fund had a subsidiary character, in that other possible compensation mechanisms first had to be examined.

\textsuperscript{62} Using tort law to obtain compensation can indeed be very costly and take a long time.

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But victims of the flooding in (former East) Germany seemed to possess very little first party insurance coverage, so that generous (but standardised) compensation was awarded through the fund.

France interestingly enough has no compensation fund for natural disasters. There the system of mandatory additional coverage on the voluntary property insurance, combined with reinsurance by the state apparently removed the need for a additional compensation fund. France merely has a (very generous) compensation fund for victims of terrorism.

Belgium has a fund solution since 1976 which applies a deductible and has standardised (limited) amounts. The fund is completely financed through the public purse, but the amounts paid out during its 25 years of existence are relatively modest (for instance compared with the amounts paid in Germany after the Elbe flooding in 2002). It is nevertheless interesting to stress that since May 2003 the role of this general compensation fund in Belgium has drastically changed since Belgium turned to the French solution of an additional mandatory coverage on voluntary insurance policies. It seems hence that one of the few countries where a compensation fund for catastrophes existed in Western Europe has now recently undertaken a revision whereby insurance now seems to be the preferred solution.

e) Summary

In sum there are very few economic reasons for a compensation fund for catastrophes, provided that an insurance system can provide adequate coverage. Most economic literature has voiced serious doubts concerning the efficiency of fund solutions. The reason these are instituted (on an ad hoc basis) is obviously the wish of politicians to satisfy the demand by a large number of voters, due to pressures in the public opinion. Given those pressures it might be preferable to work out insurance solutions, eventually combined with reinsurance by the state, since these still enable the facilitation of private market solutions. If nevertheless compensation funds seem (politically) unavoidable (either ad hoc or structural), it seems important to safeguard incentives for both potential injurers (if any and victims) on the one hand through the financing of the funds (primarily by responsible contributors) and on the other hand by still partially exposing the beneficiary of the fund to risk (via deductibles and upper limits on compensation).

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64 It merely compensates physical injury, but does not have a subsidiary character: victims can directly call on the fund, without first having to sue the terrorist in tort law. The fund is subrogated in the rights of the victim and can exercise redress against the terrorist.

65 Albeit that in Belgium this additional mandatory coverage will be limited to those insured who are particularly exposed to the risk of flooding. The fund will therefore in the future only play a limited role.
6. Concluding Remarks

In this paper I have tried to show that the law and economics methodology can be used in a meaningful way to structure the actual policy debate in Europe on the reform of compensation mechanisms for victims of catastrophes. Of course from an economic perspective victim compensation is as such not a goal of accident law, but nevertheless economics can show what the most effective instruments to guarantee such a compensation might be and what negative effects could be connected with other mechanisms.

If compensation of disaster victims is politically desired, the trend which one can now see in many European countries towards an increasing use of (mandatory) disaster coverage on first party insurances, backed up with reinsurance by the state, can be understood from an economic perspective. The insurance model clearly has advantages compared to the mere application of fund solutions, which would only invite potential accident victims to free ride on the public purse. Hence, also in Europe the legislators seem increasingly to follow the American lesson and adopt insurance solutions as a means to avoid "catastrophic reactions to catastrophic risks".  

Still several questions remain and need further research. One of these is whether potential victims actually have a clear demand for disaster coverage and whether the potential underestimation of the risk warrants mandatory coverage. Also the compatibility of the mandatory coverage with competition law needs further examination. For instance the tie-in character of the mandatory coverage and the mandatory fixing of the premium for the disaster coverage (as in France) seem debatable from a competition perspective.

The question also arises whether it is possible to limit the duty to obtain mandatory coverage to risky areas (as is the plan in Belgium) or whether this differentiation leads to substantial administrative costs that may not outweigh the advantages.

Although there are, in sum, still various questions that remain to be answered and issues that are still debated, also in the law and economics literature this is of course no argument against the use of arguments in the European policy debate. The rich law and economics literature with respect to disaster insurance can clearly enable the rationalisation of the discussion on various policy alternatives and thus enrich the policy debate in Europe.

66 In the words of R.A. Epstein (supra fn. 2).
7. List of References


