How Societies Manage Risks – Economic, Legal, and Cultural Context

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Abstract

This paper describes how societies manage risks: from catastrophe prevention and insurance solutions through to injustices of a minor and inconspicuous nature. Two highly instructive examples of this practice are nuclear liability and the measures taken in the wake of the 9/11 terrorist attack.

Keywords

Risk management, risk transfer, uncertainty, catastrophe, polluter-pays principle, nuclear liability, 9/11

1 Introduction

Our modern world is complex and thus highly vulnerable – to natural catastrophes, technical disasters and much more besides. But it has developed methods for dealing with catastrophic damage – or at least with the consequent economic losses – and has actually been quite successful in this respect. Insurance plays a pivotal role in this process; but the legal system and many public-sector measures also make a big contribution – one that is often overlooked. The basic principle is to share sudden, heavy burdens across many shoulders.
This paper describes how societies deal with risks. The goal is to demonstrate that *risk management*, a relatively new and important task for actuaries and other risk experts, has been around for a very long time, and not just at corporate management level. Society has been managing risks for ages, at the latest since the dawn of industrialization. Taking a broader view is instructive because the way in which societies deal with risks reveals mechanisms that could also be relevant to today's corporate risk managers.

The following two short sections will focus on preventive measures and on the concept of risk. Section 4 explains how risks are distributed and how certain (usually minor) injustices remain. Section 5 describes liability for accidents in nuclear power plants, the development of which has been highly political, and is thus a particularly interesting subject. The final section is devoted to the 9/11 terrorist attacks, which despite their tragic proportions represent a positive example of risk management *after the event*.

2 Prevention of accidents

Industrialized societies invest heavily in preventing serious accidents or at least mitigating their effects (see Walther). In Europe, this trend dates back centuries, where it propelled the building of dikes and the introduction of fire protection measures. All manner of expensive rescue services are in place – including first-aid services, fire brigades and disaster control teams – as well as useful services such as snow clearing and the gritting of roads and sidewalks. The protection provided by the implementation and monitoring of technical safety standards goes largely unnoticed. Today, companies and institutions of all types have put in place their own internal risk management systems so as to be able to cope better with threatening situations, whether they be stock market crashes or computer network outages.

Since all this cannot prevent accidents from happening altogether, additional measures are taken to at least dampen their financial repercussions. A traditional preventive measure is to build up financial reserves. However, insurance companies, which specialize in covering all kinds of major loss and damage, have been around for centuries, too – as have reinsurance companies. Insurance companies operate within a comprehensive legal and regulatory framework that in many ways offers those who take out insurance a measure of security – it includes, for instance, minimum capital requirements for insurers, agreed standards for insurance policies, and – last but not least – legal options for enforcing insurance claims (see Lahnstein). People are encouraged – and sometimes even compelled – to make provision against risks. A recent example is the obligation to take out private health insurance cover, which is being hotly debated in the U.S., and even in risk-averse Germany was not introduced until 2009. By contrast, motor liability insurance has long been mandatory in most industrialized countries; in many cases, too, fire insurance cover for buildings is compulsory, as is workers' compensation insurance.

Taxes, social security contributions and insurance are undoubtedly quite effective (at least cost-effective) instruments for transferring risk: money is collected from the majority and used to prevent – or mitigate the effects of – losses and damage suffered by a minority.

3 Types of risk

Prevention functions even better when you know exactly what risks you can expect to encounter. Risk theory differentiates between many different types of risk. Here are two extreme examples:

- *"Known unknowns"*: The effects of serious events and their probability of occurrence are known; but it is not known *when* the events will occur. In principle, that is the same uncertainty inherent in a toss of the dice. One example is the earthquake risk in regions that have been thoroughly examined in terms of seismic activity and where the location and quality of the buildings in the region are well known. Of course, a severe earthquake is still a threat, but systematic precautions can be taken against it, emergency plans can be drawn up and tested, fair insurance premiums can be calculated and charged, etc.
- *"Unknown unknowns"*: One can only vaguely imagine what a serious event might be like and what its probability is. That is the case with brand new technologies and with expeditions into uncharted territory, but also, for example, in regions where a volcano has become active again after being dormant for 10,000 years. It is much more

> difficult to prepare for risks like these and, at the same time, there is the latent fear of doing either far too little or far too much in the way of prevention.

This differentiation is both modern and age-old (see Gomory, Knight, Savage). The nowadays very popular alternative terms used for the two situations described above – *risk* and *uncertainty* – were introduced by the economist Frank H. Knight back in 1921(!); the instructive variant *small worlds* vs. *large worlds* was suggested in the 1950s by the statistician Leonard J. Savage.

In reality, risks usually lie somewhere between these two extremes, even though they are often clearly closer to one end of the spectrum or the other. When, for instance, a certain type of insurance is offered in a country for the very first time, that tends to be an unknown unknown for the insurer, and setting the premium for it is a thankless task. Years later, when the insurance product is in widespread use, the insurer has amassed comprehensive claims statistics and has no trouble in calculating the premium – the risk has thus moved in the direction of a known unknown, with minor uncertainty remaining as to the size and probability of claims.

The availability of insurance cover is in fact a good indicator of whether a risk is *known* or *unknown*, or that its classification has changed. Loss or damage suffered in a war, for example, is generally uninsurable because it is effectively impossible to calculate its scope and probability. In the case of damage due to terrorism, on the other hand, there are now signs that it is insurable, even though such insurance is often supported by the government – as is the case with the British public-private partnership *Pool Re* and with the German specialty insurer *Extremus*, whose cover capacity of €2.5 billion is boosted to €10 billion through government support. (It may sound cynical, but the more experience we gain with acts of terrorism, the easier it is to assess the risks involved.) Conversely, as a result of the high incidence of severe hurricanes in Florida in recent years, insurers are no longer convinced that the loss frequencies observed in the 20th century still apply. As a result, this risk is tending to become uninsurable. The public sector (i.e. society as a whole) has had to assume part of the risk through the publicly funded *Citizens Property Insurance Corporation* for those properties that can no longer find cover on the private market.

4 Restrictions on liability and the “polluter-pays principle”

Modern liberal societies have a special problem with unknown unknowns because the goal of such societies is constant progress. When they introduce innovations, they regularly take risks that are initially difficult to assess (see Walther). There is a trade-off between innovation and risk avoidance, and whenever a decision is taken on whether or not to try out something new (and potentially dangerous), the question of responsibility or liability is immediately raised.

In a nation under the rule of law, responsibility is deemed to be as follows: anyone causing damage must make good that damage or, if that is impossible, at least pay financial compensation (a specific example of this is the *polluter-pays principle* for environmental damage). So, if someone introduces an innovation and, in the process, causes loss or damage, they should be fully liable for the consequences.

As many examples from history demonstrate, this ideal can hardly be upheld in practice (see Faure & Verheij). If people who want to try out something completely new were to be burdened with full liability for this unknown unknown, they would give up their projects altogether. To ensure that people remain willing to try out promising innovations, society must shoulder part of the risk incurred by the innovators.

Sometimes this is done quite consciously, such as in the case of nuclear energy (more on which in the next section). Many countries consider this technology to be of "national importance" and have favored its growth by means of the statutory transfer of liability to the public sector. However, in many other areas, in particular where environmental damage is concerned, the damage potential was often underestimated (or simply ignored): only after a major loss occurred, and public pressure increased as a result, were regulations introduced along the lines of the polluter-pays principle. Another, often crucial, factor is whether industry – and the legal system – are still developing or already well established (see Lahnstein). Many of today's emerging economies, for instance, are repeating (but at a faster pace) the unfortunate early history of industrialization despite the fact that the negative experiences of the industrialized countries are so well known: initially lax standards for protecting the environment and workers, subsequently many accidents and enormous suffering on the part of the victims, followed by the gradual tightening of regulations.

Initial openness to technology (or an ignorance of the risks it poses) does not always prevail, however, as the example of agro genetic engineering in Europe shows (see Munich Re 2001). In the early phases of this technology's development, the political debate was dominated by worst-case scenarios. Then, the liability regulations were relaxed before being made extraordinarily strict again.

An interesting unknown unknown is the creation of computer software. Hardly any other product has such low levels of liability and warranty. Although professional programming has been around for decades, the industry is still not confident enough in the quality of its products to be able to guarantee that they are without defects. It will undoubtedly be a long time before liability for errors is introduced here as well – as it long since has for other products.

In the commercial world, there are many limitations of liability that (to a minor extent) run counter to the polluter-pays principle, but which have nevertheless proved themselves in practice. It is not so much about potential accidents, but has more to do with normal economic activities that can result in major financial losses. A case in point is the *limited liability company*, the purpose of which is to cap the risk of financial loss on the part of the company's

owners (thus passing on the loss, at least in part, to the company's business partners). *Corporations* are, in principle, investments without the obligation to provide additional capital, i.e. the investors' risk is limited to the amounts of their respective investments. And then there is the *insolvency* process, which relieves both companies and individuals of the burden of a lifetime of debt. In all these cases, the creditors bear a portion of the risk.
In the opinion of many economists, *limited liability* is a cornerstone of our modern economic system and made many key investments and innovations possible in the first place (see Sinn). From the standpoint of the polluter-pays principle, limited liability is not ideal, but the business partners of market players with limited liability are aware of the risk and are called upon to choose carefully with whom they do business.

The situation is radically different with accidents, such as chemical spills in factories. Accidents of this kind have repercussions not only for the factory owners and possibly their business partners, but also for ordinary citizens who have nothing to do with the business of the factory – and who have no chance of avoiding the risk. In this case, the polluter-pays principle is desirable, i.e. full liability of the operator (who should have adequate financial reserves or take out insurance) and full compensation for any damage caused.

But that is not always the case, as the following example demonstrates.

5 Nuclear liability

In many countries, the legislation governing liability for nuclear accidents has led to a complex system of private and public guarantees (see in the following Faure & Verheij), although discernible efforts are being made to reduce public liability at the expense of the plant operators. Let us first take a look at the situation in Germany.

The German *Nuclear Energy Act* (see F.R.Germany) is a shining example of how operators of a new technology are initially freed from liability, making it possible for them to tackle innovation and its attendant risks. The law sets out the liability of nuclear plant operators and how they are to insure themselves. It was first drafted in 1959, a time of euphoria for technology, and was thus very favorable for the energy companies (as were corresponding laws in other countries). As nuclear energy became established, however, the law was revised several times and made more stringent. The status quo in 2018 is as follows:

- Strict liability applies. In principle it is unlimited – but only since 1985 – though limits still apply in the case of severe natural catastrophes and armed conflicts.

- Every operator must take out liability insurance with a limit of indemnity of €256 million (equivalent to the DM 500 million originally mentioned in the law). Cover of this type is provided by nuclear insurance pools – consortia of insurers that have been set up in many countries, primarily to insure the respective country's nuclear power plants.
- Any damage in excess of the above amount, up to €2.5 billion, has been covered – since 2002 – through a solidarity agreement between the four nuclear plant operators in Germany (E.ON, RWE, EnBW, and Vattenfall Europe). Under the solidarity agreement, the four utilities have undertaken to support each other and must back their liability with corresponding assets.
- Amounts in excess of €2.5 billion are borne by each operator individually. That is termed *self-insurance*.

In the notation of reinsurers and industrial insurers, this form of "layered" insurance cover would be expressed as follows (in € millions):

256	xs	0	insurance
2244	xs	256	operators' "pool"
unlimited	xs	2500	self-insured by operator

Up until a few years ago, the government also shouldered part of the liability via a 500 xs 2500 layer. However, following revision of the law in 2012, this was combined with the top layer that each operator must guarantee itself. As far as this layer is concerned, the decisive question is whether such large amounts of damage are conceivable at all. What would a *major nuclear accident* in Germany cost? Although projections of this type can never be truly precise, serious studies carried out by physicists and economists for, among others, the German government put the figure at somewhere between about €500 billion and €5 trillion (!). That is more than a hundred (or thousand, respectively) times the figure covered by insurance and the solidarity agreement together.

Thus, the level of insurance set down in the German Nuclear Energy Act can be deemed adequate only if one believes there is *absolutely no possibility* of a serious or major accident occurring at a German nuclear power plant. By way of comparison: when it became apparent that, nowadays, the cost of caring for a person who has been severely disabled by a car accident could, in extreme cases, be as high as several million euros, the *minimum limit of indemnity* for personal injury in motor liability insurance in Germany was raised in 2007 to €7.5 million, an amount that is virtually never exceeded. The purpose was not so much to protect the person who caused the accident against financial ruin, but to protect the victims of road accidents – accident victims should not need to fight long battles to gain compensation for their injuries, and adequate insurance cover is the best way of ensuring that. (The same motivation has led to a EU directive on minimum amounts covered by compulsory motor liability insurance.)

Despite increasingly stringent laws, therefore, the protection afforded victims of nuclear accidents in Germany – provided one considers a serious or major accident a possibility – is much worse than that afforded victims of road accidents. The reason is clear: in spite of their financial strength, energy companies are simply not in a position to pay liability claims for hundreds of billions of euros. That would bankrupt them, and the victims would be left on their own with their damage and injuries unless the government were prepared to step in and help them.

And yet, in Germany, the liability of nuclear plant operators and the protection against nuclear damage granted to citizens through insurance cover, etc. is very high by international standards. Only very few countries have introduced unlimited operator liability at all; in most cases liability is limited. As for the operators' limits of liability, most are well below the figure of €2.5 billion that can be relied on in Germany (layers 1 and 2) – liability for anything above the operators' limits rests solely with the government. By way of orientation: the international treaties on nuclear energy liability currently in force demand only that plant operators bear a share of about €6 million in the total amount of liability – that equates to the minimum amount of liability from the early days of the nuclear power industry. In the wake of the *Chernobyl* disaster in 1986, there was a push toward much more stringent liability, and in Europe a minimum liability amount of €700 million for operators was agreed (after many years of negotiations). However, in 2018 – 32 years after Chernobyl – the corresponding treaty (Paris Convention on Nuclear Third Party Liability, 2004 Protocol) is still not in force because hardly any country has ratified it. (The EU countries have been preparing synchronized ratification for some time.)
The 2004 Protocol would lead to a layered public-private allocation of the liability as follows (in € millions, see Borovas & Coles):

700	xs	0	operator
500	xs	700	country of plant
300	xs	1200	pool of signatory countries

Higher limits at national level are possible. E.g. the UK government intends to pass its guarantee (the medium layer) step-wise to the respective operators, which will thus ultimately be liable up to €1.2 billion.
Some countries have been trying for some time to implement the €700 million limit for the operator's liability at national level, and the legislative processes seem to have gathered pace since the major accident at *Fukushima* in March 2011. By the way: as far as natural catastrophes are concerned, nuclear plant operators in Japan (as in Germany) are not liable for damage caused either by events like these or by acts of war.

In spite of some improvements over time, the situation of the individual citizen is very unfavorable in that it is virtually impossible to purchase private cover: damage caused by nuclear power has traditionally been excluded from insurance policies. Like war, it is

considered to be uninsurable, so that only the meager cover offered by the Nuclear Energy Act remains. In the event of a catastrophe, therefore, a large part of the damage would have to be borne by the victims themselves (or by society as a whole).

The United States is a special case when it comes to liability for nuclear damage. There, under the *Price-Anderson Act*, a purely private-sector insurance pool was set up with enormous coverage. As in Germany, this pool enhances the (low) amounts of cover available in the insurance market. The total amount guaranteed by this pool, in which all nuclear plant operators participate, is geared to the number of plants in operation and is currently (2018) around U.S.$12 billion. At the same time, this represents the limit of the operators' liability; any damage exceeding that amount would have to be borne by the government. So this set-up is at once stronger (high liability of the pool) and weaker (limited operator liability) than its German counterpart.

Although the differences between countries are great, all countries that use nuclear power are similar in that the loss potential in regions with high population density and high concentrations of assets is far in excess of the liability cover in place (see Lelieveld & al.). Even though this glaring disparity may give us cause for concern or even anger – indeed, calls for a massive extension of liability cover are regularly heard in industrialized countries – the problem should not be viewed from the standpoint of the national economy or consumers alone. If one wants to transfer risks to the private sector, the possibilities and needs of the latter must be taken into account. New business generated by consumer-friendly liability legislation or mandatory insurance can harbor particular problems for the insurance industry. A number of countries, for instance, have introduced government-regulated, consumer-friendly motor liability premiums that are far too low; and in health insurance, in particular, parameters that are difficult to forecast and can change depending on the political mood can sometimes lead to huge economic and management challenges.
Even where economic and operational concerns are adequately addressed, the creative will is hampered from other directions: Although the financial strength of the international (re)insurance industry is huge, it cannot simply provide cover up to any amount, not even in cases where the probability of loss can be reliably calculated and attractive premiums charged. It is certainly no coincidence that, worldwide and across all lines of insurance, hardly any covers can be found with a capacity of substantially more than €10 billion per loss event. Apart from the above-mentioned U.S. nuclear liability pool (with a capacity of around U.S.$12 billion), the earthquake reinsurance program of Japan's biggest mutual insurer *Zenkyoren* is an example of such a cover. With comparable capacity of around U.S.$12 billion per loss event, it is considered to be the biggest catastrophe property cover in the world. But even much lower amounts of liability are traditionally carved up into smaller parcels and distributed among a large number of reinsurers so that each risk carrier's potential maximum loss remains manageable. Thus, cover amounts in the vicinity of hundreds of billions of U.S.$ or euros, let alone a trillion, would doubtless require the participation of

countless numbers of risk carriers in the financial markets and extend far beyond the scope of the insurance industry.

In spite of the difficulties that systemic change always poses, a society should regularly ask itself whether certain technologies are not already so established that their operators could be expected to shoulder a greater share of the liability they give rise to, that the rules could be changed to favor the victims, and thus – in line with the polluter-pays principle – more equity could be achieved. This is in fact happening, but progress is rather slow – not just in the case of nuclear power. From liability for medical malpractice through to the environmental damage caused by oil drilling, there are many areas in which the prescribed limits of indemnity bear no relation to the potential loss amounts. This was evident in the *Deepwater Horizon* catastrophe. As a result of the low – or complete lack of – insurance cover of the oil companies involved, the insurance industry's estimated contribution of U.S.$5 billion will cover only a fraction of the total damage (see Lowe & al.). Dealing with the "remainder" of the bill has been a huge financial challenge for the companies that caused the damage. Alongside such spectacular cases as this one, there are numerous examples of accidents that are by no means "worst case" and yet are still too big for existing insurance covers. In these cases, no one can claim there is a lack of capacity in the insurance market because the amounts in question can generally be placed without any problem (provided that fair premium rates can be charged).

6 The World Trade Center loss

This paper will conclude by showing how, even after a catastrophe has occurred, measures can be taken to share the burden more effectively across many shoulders. The case in point is the 9/11 terrorist attack. It is a remarkable case of risk management "after the event" (see in the following Dixon & Stern).

On September 11, 2001, terrorists hijacked four airliners, using them as weapons to destroy New York's two tallest skyscrapers as well as other buildings in the city's financial district, and to cause serious damage to the Pentagon in Washington. (The fourth aircraft crashed before reaching its target.) A total of 3,000 people were killed (some 400 of them rescue workers, police and helpers) and 250 were seriously injured. Many of the victims were highly paid employees in the financial services industry, and a good 60 % of them were married – facts of relevance for the level of compensation.
The insured loss across all lines of insurance – from buildings insurance through to life insurance – amounted to around U.S.$32–40 billion (there is wide variation in the published figures). In the wake of the attack, estimates of the economic damage were exorbitant,

ranging as high as U.S.$1,000 billion, though it must be said that the financial losses in the capital markets in the weeks following the attack were included in that amount.
Survivors of the attack and the dependents of those who perished, had access to four sources of compensation (which were not mutually exclusive):

- their own insurance covers;
- the tort system (suing those responsible for damages);
- government programs;
- charity.

The list of those potentially responsible for the attack – and thus potentially suable – was long:

- airlines (United Airlines, American Airlines);
- airports;
- security firms (responsible for security checks at airports);
- the authorities, the City of New York;
- police and fire brigade;
- Motorola;
- terrorist groups;
- members of the Saudi-Arabian government (as the alleged financial backers of terrorist groups);
- ...

Attention focused on Motorola because it was alleged that faulty handheld radios manufactured by the company had led to the deaths of firefighters. That even rescuers and helpers could be sued was deemed a real possibility as that had often occurred in the U.S. in the past after major losses, especially after the liability cover of the responsible parties had been used up.

The measures taken by U.S. politicians to cope with the loss were unorthodox, to say the least. (This will become clearer in the following.) However, they are an impressive example of a society's ability to take action in the face of a severe crisis.

6.1 Ensuring the survival of institutions

The U.S. Congress passed the *Air Transportation Safety and Stabilization Act* (ATSSA) in order to settle the World Trade Center (WTC) loss. It came into force a mere 11(!) days after the attack and comprised the following provisions:

- Exclusive jurisdiction was granted to the U.S. District Court for the Southern District of New York for all cases related to the terrorist attacks of 9/11. This was intended to

prevent the victims from filing suits in other, potentially more plaintiff-friendly, jurisdictions. Known as *forum shopping*, this is a popular strategy in America's federal, highly heterogeneous judicial system.

- The liability of many U.S. institutions was retroactively (!) capped at an amount corresponding to each institution's existing liability insurance cover. In the case of the two airlines, that figure was U.S.$1.5 billion each, while the City of New York's liability was limited to U.S.$350 million. Similar limits were imposed for the *New York Port Authority* (which administers key municipal facilities such as airports and, at that time, managed the WTC site, too) and for other authorities. Clearly, this kind of retroactive amendment of the law must, in legal terms, be considered at the very least unusual.
- Tax breaks were introduced for the victims.
- A separate fund was set up for the victims, the *Victims Compensation Fund* (VCF); see the following section.

6.2 Channeling of benefits

The task of the VCF was to compensate the victims in accordance with a standardized procedure – quickly, generously and without a lot of red tape. Although they were not compelled to settle their claims via the VCF, there were incentives to do so – although conditions were imposed as well. The details of the process were as follows:

- It was guaranteed that the claims would be processed within three years (which is much faster than if the victims had sought compensation through long, drawn-out legal battles).
- The compensation was paid on the basis of presumed future income lost by the surviving dependents or injured persons as a result of the attack. While this type of damages is customary, under the VCF the onus of proof was more relaxed than in court proceedings.
- In the case of very high incomes, restrictions were imposed or the onus of proof was made more stringent.
- Awards for *noneconomic loss* were capped (and were lower than what the plaintiffs could have stood to receive in a court case).
- The majority of insurance benefits received by the victims (life insurance, workers' compensation insurance, etc.) were deducted from their VCF compensation. That is not in accordance with common legal practice. Such deductions would typically not be allowed because it disadvantages those who took precautions in the past and paid high insurance premiums and favors those who gave no thought to insuring themselves.
- No *punitive damages* were paid. (These are damages going far beyond the actual amount requiring compensation and are customary in the U.S. legal system.)

- Waiver of legal actions for damages: a condition of participation in the VCF compensation process was the waiver of any legal actions in respect of the attack against U.S. institutions or companies.

6.3 Creation of an atmosphere of solidarity and patriotism

The insurance industry waited with bated breath to see how the WTC loss would be settled. The industry's fear was that adverse selection would prevail, i.e. only those victims would settle via the VCF who could expect to receive similar or higher benefits from the fund than they would if they sued in an ordinary court. Top-earners and victims with higher insurance claims were expected to opt for litigation and fight long battles for their high claims, further augmented by punitive damages. (Given the mood of hysteria in the country at that time, it seemed plausible that some judges would want to set an example, awarding exorbitant damages against those who had so lamentably "failed" in preventing the terrorist attacks.)
The result would have been an avalanche of legal proceedings lasting years, coupled with constant negative press. In the final analysis, that would have led to a process of social self-destruction with economic consequences far beyond the liability claims payable.

That did not happen, however. The VCF was a resounding success. Of the families affected by the disaster, 97% opted for the VCF process and have long since received final compensation. Only 70 families decided on litigation, and thus on years of legal proceedings with relatively low chances of success. The VCF has paid out a total U.S.$5.6 billion to "civilian" victims (i.e. not to police or rescue workers). What is more, the victims received about U.S.$1 billion under their life insurance policies and a further U.S.$1 billion under their workers' compensation policies; by deducting insurance benefits from the compensation it paid, the VCF thus reduced its financial burden by about U.S.$2 billion. Together with money from charities and smaller government programs, the civilian victims that participated in the VCF process have received a total U.S.$8.7 billion, an average of three million per person. On top of this is the U.S.$1.9 billion that the VCF paid to police and rescue workers.
For the sake of completeness, it should be mentioned that the compensation process for this latter group, including those involved in clean-up operations afterwards, did not go smoothly. There were lengthy disputes, and the situation was complicated by countless cases of injury that were not recognized until well after the event and which were difficult to assess, e.g. because they could have been caused by dust particles at the Ground Zero site. A full ten years after the attack, the dispute was still the subject of regular reports in the press; that is how long it took to resolve key issues and for the government to award further high compensation amounts.

Now that verdicts have been reached in the court cases of the 70 plaintiffs, it is possible to compare their awards with the compensation paid by the VCF (see Munich Re 2012). The

average award per successful court case amounted to around U.S.$7 million, including punitive damages. Although that is substantially more than the VCF average, after ten years of uncertainty and legal battles, and after deduction of legal fees, the litigation path cannot, in retrospect, be deemed to have been lucrative, especially when you consider that the families who opted for it would probably have received above-average compensation from the VCF anyway. In any case, the total amount extracted through litigation was small in comparison with the VCF payout.

Why did so few of the victims reject the VCF? True, the conditions it was offering were not unattractive, and the other provisions of the ATSSA made success through litigation less likely. But when you consider how litigious U.S. citizens are in general, it is astonishing that the widespread anger in the country after the terrorist attacks – which was directed not only at the terrorists themselves, but also at the negligence of the country's own institutions – did not trigger an avalanche of lawsuits.
It seems that an atmosphere of national solidarity arose, in the face of which hardly any of the WTC victims were prepared to break ranks and gamble on getting a better award from the courts. Clever public relations work probably played a decisive role in this. The then mayor of New York, Rudy Giuliani, received numerous accolades, including *Time* magazine's "Person of the year 2001" award, for his behavior in the wake of the attack (see Pooley). From the very first moment, he strove to revive the spirit of the city, with patriotic lines such as: "Tomorrow New York is going to be here. And we're going to rebuild, and we're going to be stronger than we were before. ... I want the people of New York to be an example to the rest of the country, and the rest of the world, that terrorism can't stop us."

All in all, we can say that, in administrative and economic terms, the United States coped well with the 9/11 attack. Even the capital markets recovered from their post-9/11 crash within a few months.
From the point of view of justice or fairness, it must be conceded that fundamental legal principles were violated during the process of settling the victims' claims. But we must not lose sight of the fact that most of the victims voluntarily waived their rights.

We may presume that effective catastrophe management is sometimes to be had only at the price of uneven justice. The settlement of the World Trade Center loss will be remembered as a successful, though perhaps singular, example of how society deals with a watershed event – namely by briefly breaking its own rules.

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