

Overcoming Myopia





Learning From the BP Oil Spill and Other Catastrophes

**BY HOWARD C. KUNREUTHER
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The 2010 oil spill on the Gulf Coast is just the latest disaster that highlights a general problem: Decision makers often regard catastrophic events as below their threshold of concern until they occur. This seems to be true for all decision makers – business professionals, homeowners and public officials in charge of minimizing disaster damage. Read the questions below, and ask yourself if you would really, truly answer them differently:

Q: Could my company be responsible for a mishap that would have major enduring social, economic and environmental impact?

A: It's not going to happen to us!

Q: Would I have the financial resources to rebuild my house after a hurricane?

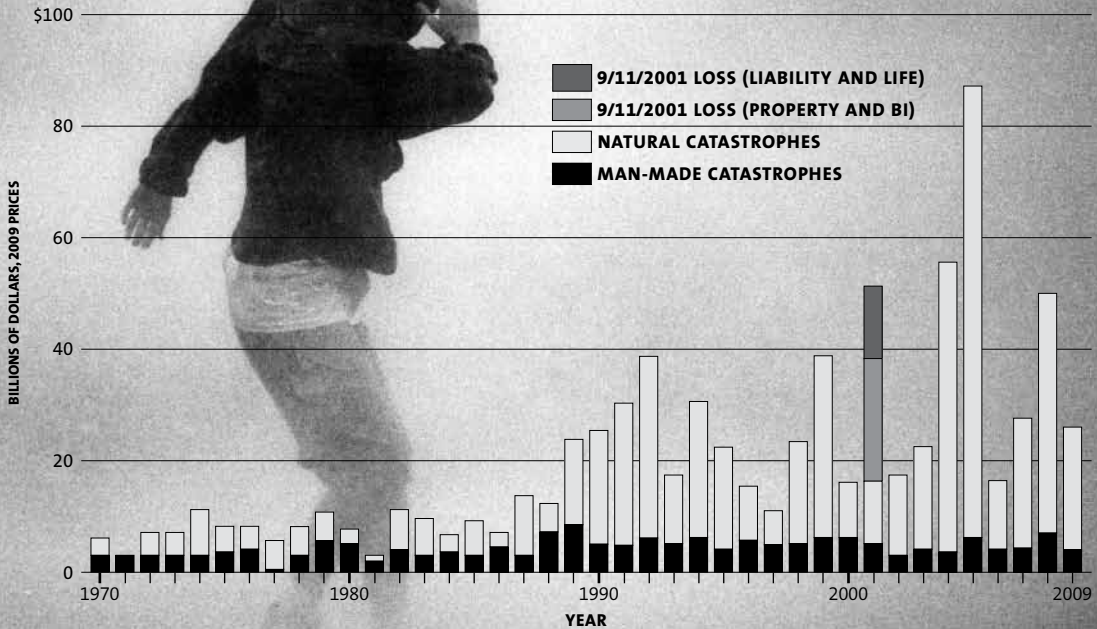
A: The government would bail me out.

Q: Could a cyberattack paralyze our infrastructure for several days?

A: Science fiction!

WORLDWIDE EVOLUTION OF

CATASTROPHE INSURED LOSSES, 1970-2009



SOURCE: Kunreuther and Michel-Kerjan, *At War With the Weather* (MIT Press, 2009)

Accordingly, oil companies underinvest in measures to decrease the likelihood of a major spill as well as in ways to limit the damage if one does occur. Many property owners decide to buy flood insurance only after their houses are under water – and then cancel them a few years later if they haven’t experienced further damage. Public officials won’t burn political capital by imposing costly, but economically justifiable, regulations on bank exposure to financial risk in advance of a crisis because they don’t see how it would help them get re-elected.

Yet as the economy becomes larger, more complex and arguably more vulnerable to a wide variety of catastrophes, the potential con-

sequences of such myopic behavior grow. Not addressing them will simply make the impact of future events more devastating.

A NEW ERA OF CATASTROPHES

Large-scale disasters are low-probability events – but the probability is not as low as it once was. Indeed, such disasters have come with startling frequency in the last decade:

Terrorist attacks in New York and Washington (September 2001) killed thousands and forced wrenching changes in security efforts around the world... The Northeast blackout (August 2003) demonstrated how human error and short-term competitive pressure could deprive more than 50 million people of electricity in the United States and Canada... The great Indian Ocean tsunami (December 2004) killed some 300,000 people... Hurricane Katrina (August 2005) devastated New Orleans and overwhelmed emergency services capacities... An earthquake in Sichuan province in China (May 2008) killed

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nearly 70,000, just a few weeks after a major cyclone killed more than 100,000 in Myanmar... A massive earthquake in Haiti (January 2010) killed 230,000, and a few weeks later another one in Chile caused multi-billion dollar property damage... The collapse of the mortgage bubble (mid-2008) triggered the longest and deepest global economic downturn since the Great Depression... And, of course, the recent BP oil spill (April 2010) cost the U.S. economy billions and damaged the ecology of the Gulf of Mexico in ways not yet fully known.

The severity of these events suggests that the world is changing and that we have entered a new era of catastrophes. Of the 25 most costly insured catastrophes in the world since 1970, 17 occurred since 2001. From 1970 to the mid-1980s, annual insured losses from natural disasters (including forest fires) were in the \$3 billion to \$4 billion range. In fact, before Hurricane Hugo in 1989, the insurance industry had never suffered a single loss over

\$1 billion. But these losses radically increased in the 1990s and that trend has continued.

The principal reason is that more people are residing in hazard-prone areas and, as a result, more property is at risk. Take Florida. The population was 2.8 million in 1950; today, it is close to 19 million. So a Category 3 hurricane that would have had limited economic impact 60 years ago is likely to do multibillion dollar damage today. By one estimate, the damage from Hurricane Andrew, which occurred in 1992, would be more than twice as great if it occurred in 2010. Today, there are nearly \$10 trillion of insured assets on the coast running from Texas to Maine (private and public insurance), all of it at risk from major hurricanes.

BEHAVIORAL BIAS

What explains our unwillingness to look ahead and act? Findings from lab experiments and field studies by psychologists and behavioral economists reveal a variety of biases that

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cause decision makers to ignore both the likelihood and the potential consequences of large-scale disasters.

Misperceptions of the risk. We often underestimate the likelihood and consequences of extreme events, either by failing to imagine the scenarios in which they might occur or by simply assuming that “it will not happen to me.”

Ambiguity of experts. Estimates of the likelihood and consequences of low probability events often differ, given the limited historical data and considerable scientific uncertainty. Decision makers often choose to use the estimates from experts that provide justifications for their preferred actions.

Short horizons for valuing protective measures. Businesses (and households) look only a few years ahead (if not just months) in deciding whether to spend money on loss-reducing measures like strengthening structures to reduce hurricane damage. As a result, risk-reducing measures that could be justified financially when comparing costs and expected returns over the long run are often rejected.

Disregarding interdependencies. The value of some investments for disaster protection depends on the willingness of others to undertake parallel actions. For example, bank regulation or anti-terrorism measures are far less effective if other nations aren't on board. Thus, individual countries or companies are reluctant to be first movers, lest they waste political and financial capital.

Failure to learn from past disasters. There is a tendency to discount past unpleasant experiences. Emotions are high when we experience a catastrophic event, or even view it on television or the Internet. But those emotions fade, making it difficult to recapture these concerns about the event as time passes.

Mimetic blindness. Decision makers often imitate the behavior of others without ana-



lyzing whether the action is appropriate for them. By doing what other firms do in their industry (or imitating the behavior of friends and neighbors), decision makers can avoid the psychological stress of thinking independently. There is also a tendency to favor the status quo – to not change current practice.

In addition to behavioral biases, there are economically rational reasons that firms and individuals in hazard-prone areas don't undertake risk-avoidance measures. Consider MonkeySee, a hypothetical firm in an industry in which its competitors do not invest in



loss prevention. MonkeySee might understand that investment can be justified when considering how it reduces the risks and consequences of a future disaster. However, in the near term, the firm may be at a competitive disadvantage because it must bear the higher costs of risk avoidance.

Or consider the equally hypothetical Safelee family, which is deciding whether to invest in disaster prevention – say, in a non-flammable roof for the house. If they plan to move in a few years and doubt that potential buyers would appropriately value such a roof,

they may find that the short-term benefits are less than the cost of the improvement.

THEORY MADE REAL

Many recent catastrophes can be tied in part to behavioral biases.

The BP Oil Spill

BP's behavior in recent years is puzzling. On the one hand, the giant oil company has invested heavily in green technologies, a seemingly long-term view of the company's future prospects. BP Solar has become one of the



world's largest developers and manufacturers of solar power equipment. And since 2005, the company has invested in wind power as well.

On the other hand, BP's behavior in its core business suggests that the company is myopic with respect to risk, and adapts poorly to past mistakes. A 2005 explosion at BP's Texas City plant killed 15 people and injured more than 170 others in one of America's worst industrial accidents in a generation. The government subsequently identified

more than 300 safety violations, and BP agreed to pay \$21 million in fines.

There have been other BP accidents since the Texas City explosion. A BP oil platform in the deepwater Gulf of Mexico almost sank in Hurricane Dennis in 2005, and the company was responsible for a significant oil spill in Alaska in 2006.

BP exhibits several of the decision biases we discussed above, including maintaining the status quo and mimetic blindness. Appar-



ently no one else in the industry had an adequate plan for a deepwater failure. It is likely that BP could not imagine the scale of the disaster that occurred last April in the Gulf Coast or the impact it could have on so many others – and in the end, on its own reputation.

Challenger and Columbia Shuttle Accidents

The destruction of the space shuttle Challenger shortly after takeoff on Jan. 28, 1986,

was caused by a failure of a simple engine part – the now-infamous O-rings. Diane Vaughan of Boston University concluded that this tragedy was due to an organizational culture in which production costs took priority over safety. NASA had flown previous shuttles despite recurring O-ring damage. And agency officials were intent on flying the shuttle to maintain financing for the space program and viewed the likelihood of such a disaster as below their threshold of concern.

Strikingly, NASA behaved similarly with the Columbia shuttle in February 2003. Despite warning signs and reports that foam debris could cause deadly damage to the aging Columbia, the agency decided to launch – a decision apparently driven by NASA’s focus on making sure that shuttles were launched on time after a history of repeated delays. Eighty-two seconds into the flight, foam debris damaged the shuttle’s thermal protection system, causing the craft to break up upon re-entry. Flight operations were delayed for two years after the catastrophe.

Terrorism Insurance Markets Before and After 9/11

Even risk analysis experts demonstrate behavioral biases. Before 9/11, insurers operating in the United States viewed potential losses from terrorism as so improbable that the risk was neither explicitly mentioned nor priced in any standard policy. Moreover, terrorism was not excluded from so-called “all risk” insurance with the exception of some marine cargo, aviation and political risk policies. The first World Trade Center attack in 1993 (which cost insurers more than \$700 million) and the Oklahoma City bombing in 1995 were thus not seen as foreboding enough for insurers to revise their view of the terrorist risk. The actuarial models that insurers used to set premiums included no explicit estimate

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of the expected cost of terrorism. Most tellingly, there was no change in the way risk was evaluated in the wake of these incidents.

Insurers and reinsurers paid \$35 billion for the 9/11 attacks – at that time the most costly event in the history of insurance. After that, most of them swung to the other extreme, refusing to offer coverage against terrorism at any price, even though the likelihood of another successful attack on U.S. soil was presumably lower, given the renewed security efforts by governments and private companies.

Non-enforcement of Building Codes

Our Wharton colleague Robert Meyer has studied the devastation of Pass Christian, Miss., by Hurricane Katrina in 2005. The storm wiped out all structures on the coast. But apparently no lessons were learned: an apartment complex was rebuilt in 2007 – on the same vulnerable site.

Ironically, this was not the first time that apartments had been rebuilt in this area after a disaster. Hurricane Camille destroyed the coastal buildings in Pass Christian in 1969. Although building codes had been in place since 1957, they were not enforced. And they were not enforced again after Camille. Indeed, the obligation to obtain a building permit was initially waived. As a result, homes and businesses built after Camille were wiped out by Katrina.

Failure of Individuals to Purchase Flood Insurance

Since 1968, flood insurance has been provided at relatively inexpensive rates in hazard-prone areas by the federal government through the National Flood Insurance Program (NFIP). Still, many people who live in flood-prone areas don't buy coverage. Many behavioral biases apply here: residents misper-

ceive the degree of risk, or simply don't believe a flood could happen to them. Others have short-term horizons. Accordingly, if they have not collected on their insurance policies after a few years, they cancel them.

Based on an analysis of the 10-year data set of the entire portfolio of the NFIP, we found that, on average, people let their flood insurance policies lapse after just three or four years. Interestingly, this average tenure hasn't changed since Hurricane Katrina, when flood insurance claims exceeded \$16 billion – a record for this program, which covers more than five million households. While many more people bought flood insurance immediately after the disaster, attention faded a year or two later.

The evidence of such imprudent behavior is illuminating. For instance, *The New York Times* reported that six out of 10 residents in Orleans Parish had no flood insurance when Katrina hit. Or consider the flood in August 1998 that damaged property in northern Vermont. FEMA found that 45 percent of those who resided in designated flood hazard areas had evaded their obligation to maintain insurance coverage.

WHAT TO DO

As these examples show, we excessively discount future returns by focusing on short-term rewards. That is, we don't invest in costly mitigation measures because the upfront expenses exceed the short-run benefits. Those concerned with managing extreme events thus need to recognize the importance of providing incentives to offset this myopia.

To that end, regulations designed to reduce the likelihood of catastrophic events and to ensure preparedness for recovery need to be tightly enforced. It is important that financial incentives be structured so decision makers' interests mesh with those of society.

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For example, executive pay needs to be linked to the long-term performance of a firm, rather than being based on what happened during the past 12 months. It would also make sense to figure out ways to create more immediate rewards for investments in disaster prevention – say, by reducing insurance premiums for homeowners who meet minimum standards. By extending the time horizon and creating appropriate economic incentive systems, we may be able to nudge individuals into taking steps to reduce their own risk exposure while reducing the costs to society in the process.

As a concrete example, consider the case of flood risk. One idea we have proposed would be to move from the traditional one-year flood insurance contract and adopt multi-year contracts attached to the property, not to the owner. This would give houses in flood-prone areas a fixed, inflation-corrected annual premium for a designated period (for example, 5 or 10 years).

In addition, if long-term loans for flood mitigation were offered by banks, households with multiyear flood insurance policies would be encouraged to invest in loss reduction measures. If the measures were cost-effective, the discounts in annual insurance premiums would be greater than the annual cost of the loans. So homeowners would see an immediate advantage in investing in such loss-reduction measures. Should the owner sell the property before the end of the policy period, both the insurance and the loan would automatically be transferred to the new owner.

Under such a program, millions of house-

holds that are uninsured today would be financially protected, banks would have more secure assets, and the general taxpayer would assume a lower cost of disaster relief after future floods and water-related damage from hurricanes. A win-win-win for all!

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Human nature is... human nature. We cannot expect policymakers, investors, business executives, homeowners and others in positions to influence disaster mitigation to act rationally without a financial nudge and/or clearly enforced obligations. Nor is it enough to wring our hands and talk loudly after each fresh outrage. We need to give people tangible incentives to do the right things.

Happily, these seem to be ideas whose time has come. Two examples from our own experience: The World Economic Forum has begun an initiative on global risks in partnership with the Wharton Risk Center and private industry. The project evaluates expert views on the severity and interdependencies of 20 risks over the next 10 years and suggests strategies to manage them using private-public partnerships. Similarly, the Organization for Economic Cooperation and Development established an International Network on the Financial Management of Catastrophes in 2006 (again, in partnership with the Wharton Risk Center). The goal is to develop strategies for financing recovery after major man-made and natural disasters that will also encourage investments in risk-reducing measures.

Fortune, reminded Sophocles, cannot aid those who do nothing. **M**