



Theme-Based Book Review: Risk and Uncertainty

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Abstract

This theme-based book review considers three recent titles related to risk and uncertainty: *The Dynamics of Risk: Changing Technologies and Collective Action in Seismic Events*, by Louise K. Comfort; *Doom: The Politics of Catastrophe*, by Niall Ferguson; and *Fragile Futures: The Uncertain Economics of Disasters, Pandemics, and Climate Change*, by Vito Tanzi.

Keywords risk · uncertainty · disasters · pandemics · climate change · book reviews

Introduction

In *Risk, Uncertainty, and Profit*, Frank Knight observed that “Policies must fail, and fail disastrously, which are based on perpetual motion reasoning without the recognition that it is such” (1921, p. 11). There is substantial difference between risk (*measurable*) and uncertainty (*unmeasurable*, in the Knight framework); operating in the area of risk may still allow for return, if not reward, provided that efforts are taken to measure and guard against risk. Acting in an overconfident manner in an area of uncertainty, however, can prove ruinous. We must know what we are doing (Knight, 1921), and in order for that to occur, there must be some basis for our actions; in times of complexity, and in absence of information upon which to make a decision (uncertainty), so much of what occurs in the public space is unfortunately just a guess.

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Scoones & Stirling (2020) echoed the need for appreciation of uncertainty, cautioning against oversimplification of complex problems and limitation of the range of available solutions. Policymakers make assumptions about how people will behave in crises, and these expectations may end up being wrong. As an example, ambiguity in the decision-making environment and attitudes about risk can affect whether consumers buy insurance for uncertain future losses (Lambregts et al., 2021). Successful management of risk in the public space requires effective communication, including of matters where uncertainty is present; ‘owning’ uncertainty and being clear about what is known and not known allows official communication to be publicly accountable, even if that is perhaps not politically palatable (a point taken up in recent books, including those discussed in this book review). It has been noted that it can be difficult to publicly discuss the scientific process, including the idea of dissensus, even though it is a normal and valued part of science (Doyle et al., 2019). Further, disasters are heavily context specific, and can be cascading and cumulative (Gong et al., 2020).

The human element in the complexity of risk, uncertainty, and the potential for disaster should not be underestimated. Uncertainty is often not communicated well; risk, similarly, is perhaps not well understood in public settings, leading to misunderstanding and behaviors that are possibly dangerous. Government and media communications can inflate a sense of risk and anxiety, if not general fear, and encourage actions that seek to mitigate those feelings, moving people from prepared for disaster, to out of balance (Mills, 2019). Cheong found that “individuals exhibit lower risk aversion in response to disaster experience over time” (2022, p. 19). Personal experiences can weigh heavily in how households perceive risk, in the case of seismic risk, and this might lead to choices that are not as rational as they could be (for example, early life experiences being overweighted relative to later life experiences) (Gao et al., 2020). Whenever people are involved, risk and uncertainty take on even greater levels of complexity in terms of public policy, its design and implementation, and practical concerns when real-life hazards are encountered.

Interest in the literature on risk and uncertainty has continued unabated and the COVID-19 pandemic has likely sharpened this interest for the foreseeable future, though application of this theme to disasters generally remains. This theme-based book review focuses on three recent titles related to risk and uncertainty in disaster: *The Dynamics of Risk: Changing Technologies and Collective Action in Seismic Events*, by Louise K. Comfort; *Doom: The Politics of Catastrophe*, by Niall Ferguson; and *Fragile Futures: The Uncertain Economics of Disasters, Pandemics, and Climate Change*, by Vito Tanzi.

Louise K. Comfort. (2019). *The Dynamics of Risk: Changing Technologies and Collective Action in Seismic Events*. Princeton University Press. 336 pp. ISBN 9780691165363 (hbk, \$99.95 USD); ISBN 9780691165370 (pbk, \$38.00 USD)

The Dynamics of Risk (Comfort, 2019) represents the culmination of more than 20 years of work by Professor Louise Comfort and her team. This sweeping exploration of risk and resilience in seismic events is at once monumental in scope and impor-

tance, and yet accessible and readable, and written in a way that should appeal to an audience well beyond the emergency management communities in scholarship or practice. Dealing with seismic risk is perhaps an underappreciated problem, unusual in the spacing of events and difficulty in prediction; it is a problem at the intersection of nature, the built environment, and humankind's capacity to assess risk, remember past events, and learn from experiences to reduce risk in the future. Seismic events are nevertheless some of the most costly and disruptive events encountered, and systems that ignore complexity and intensely interconnected frameworks are bound to fail when confronted with extreme events, particularly those brought about by seismic shifts.

The book begins with a consideration of various perspectives of risk – as an international policy problem, as a shared public risk, and the role of complex adaptive systems. The evolving nature of risk and its management is thought to be one of the defining problems of the present century. Risk can be thought of in terms of four initial conditions – time, space, scale, and energy; Comfort returns to this throughout the book to address the central question of managing complex adaptive systems. Throughout the text, the essential issue of effective communication of information in crisis situations is highlighted. The book's chapters pull from a rich program of case studies: 12 earthquake response systems are newly analyzed, representing the period from 1999 to 2015; together with previous work, the study explores 23 earthquake response systems over 30 years, in 14 countries.

Chapter 2 provides the theoretical grounding for the text as a whole. Risk is shown as an evolving concept, informed by technological advances and social interaction, but also how it can be confronted with collective action. Uncertainty is informed by time and space with respect to risk; decisions may be necessarily limited by the actions of others in crisis situations, and while modeling can be helpful in planning, imagination and intuition can bridge the gap in the space beyond planning, when models fail to account for all variables and events (the so-called 'empty set', of responding to situations where we simply do not know).

Chapter 3 addresses risk measurement – data sources and methods. I found Comfort's approach to comparative analysis – focusing on organizational engagement and entry of entities into the response, information flows, and transitions from response to recovery – to be especially consequential. Chapter 4 looks at risk in practice, particularly networks in support of earthquake response and approaches to their classification. A typology is set forward incorporating four levels of sociotechnical adaptation: systems that have moved toward auto-adaptive systems; operative adaptive systems; emergent adaptive systems; and nonadaptive systems.

Chapters 5 through 8 explore each of the categories of sociotechnical adaptation in turn, drawing on real-world seismic case studies. Each of the typological chapters follows a basic pattern – discussion of the type and case study or studies; initial conditions, the earthquake response system; organizational engagement patterns in network analysis; a corroboration or triangulation from other documents and reports, and a summary of the case/type. Chapters on evolution in system response and the logic of resilience complete the text.

Comfort points out that none of the cases studied fully meet the criteria for a fully auto-adaptive response system; the case that comes closest is Lushan County,

in Sichuan Province, China. In this case, ready access to social media, extensive cell-phone use, capable emergency management leadership, engagement across various sectors, jurisdictions, and inclusion of nonprofits and private-sector entities helped drastically improve the response and allow for rapid self-organization.

As a frequent student of dysfunction, I found the sections on emergent adaptive and nonadaptive systems most interesting. I have noted instances of adaptation that are limited by a perceived need to be responsive to an event, with a strong desire to ‘return to normal’ becoming an impetus to disregard lessons learned during crisis (Atkinson, 2022). Importantly, Comfort offered that “The test of adaptation is whether the damaged community can effectively learn from the extreme event and integrate insights from that experience with previous knowledge of risk to rebuild the community a more constructive, resilient form to reduce future risk” (Comfort, 2019, p. 178). It is not that some communities and places cannot learn from disaster – it may be that they simply do not wish to learn, or cannot see fit to afford the resources necessary to make resilience an ongoing priority. We are arguably beyond the point as a society where communities, regions, and nations can say they simply did not know about the risks they face; not planning for risk to improve resilience is a choice that is made, through commission or omission, but a choice either way.

It is on this point of building resilience from the experience of these events that the book closes. Comfort writes in Chapter 9 about the need to learn from events to change actions and decisions to more effectively address risk. Some places have difficulty transitioning from response (and external help) to recovery, standing independently, and making choices to improve response in the future. This is not simply a matter of technological infrastructure, or something that a government can buy and be done with – planning, learning, and preparedness are key as well. If we are seeking to build resilient systems, many of the takeaways for governments addressing seismic hazards can be found in Chapter 10. In particular, the idea of open platforms for sharing information, learning, and updating, on an ongoing basis, is essential. Coming to terms with information and technology is important for dealing with increasingly complex contexts. I found Comfort’s comments on the differences in hazard types – and specifically the weakness in mesoscale organization in 12 cases experiencing serious hazard loss – to be of great interest. Understanding the connections between technological disasters and organizational failures can be a help in limiting devastation. There is a need to choose to pursue resilience – communities can begin to make decisions at the government level, and citizens may begin to reflect this vision in their own behaviors, which can help keep everyone safer. Comfort’s suggestion of resilience as a “quiet accumulation of both science and intelligent reasoning” (p. 251) seemed to me to be a particularly eloquent way of closing what is an expertly prepared text.

Comfort is among the disaster/crisis management field’s greatest scholars and this book amply demonstrates why. As a text, *The Dynamics of Risk* echoes the definition of resilience offered above – quiet, confident in the science, eminently intelligent, and offering practical solutions with real worth. What the book does not offer is an easy way out of the threats facing humankind. Resilience is a marathon rather than a sprint, and does not itself represent a destination. This book is highly recommended for emergency management courses and programs, and is a great read for EM schol-

ars. The book would also be an excellent addition to library collections, and should be in the hands of policymakers that are thinking about how to better respond to seismic and other natural hazard threats.

Niall Ferguson. (2021). *Doom: The Politics of Catastrophe*. Penguin Press. 496 pp. ISBN 978-0593297377 (hbk, \$30 USD)

While Comfort's book is a scholarly study of seismic disaster case studies and implications for resilience, Niall Ferguson's *Doom: The Politics of Catastrophe* (2021) is a wide-ranging historical look at catastrophe. Ferguson's project explores "why do some societies and states respond to catastrophe so much better than others? Why do some fall apart, most hold together, and a few emerge stronger? Why does politics sometimes cause catastrophe?" (Ferguson, 2021, p. 7). Written during the COVID-19 pandemic, *Doom* weaves literature, popular culture, and history together with accounts of our troubled present, often in crackling prose that grips the reader. This is not a dour look at calamity; it is at times funny and amiable, even as it explores some of the gravest issues facing the past and future of our species.

The book begins with a chapter on the meaning of death (complete with a reference to a Monty Python bit about the Grim Reaper); Ferguson further touches upon apocalyptic literature and the Doomsday Clock from *the Bulletin of the Atomic Scientists* in his initial exposition. In the second chapter, stories and cycles of disaster, and warnings not heeded (termed Cassandras), are taken up. The following chapter applies gray rhinos (quoting Michele Wucker, something "dangerous, obvious, and highly probable" (p. 72)), dragon kings (Sornette's conception of an event "so extreme that it lies outside a power law distribution" (p. 74), and the arguably more well-known black swans of Nassim Taleb to the book's topic. Chapter 4 shifts focus to networks – especially important in understanding the spread of plagues. Chapter 5, titled "The Science Delusion," points out rightly that even with our vast scientific knowledge, there are still limits, and these have been shown at various points through the considerable increases in risk that have accompanied such advances as long distance travel. Ferguson also is correct in pointing out that with the advance of science, areas once thought 'settled' have actually been shown to be quackery or bad science, and have subsequently fallen by the wayside. There is good reason to believe this should continue to be the case as society advances.

One of the best sections in the book is a chapter on political incompetence. Ferguson's points about personal ambition and lack of concern for others should hit home. A point is made about government experts being useful to politicians, but that the opposite is also true, and this is frequently the case. He is also right that "in moments of imperial disintegration...violence reaches new heights" (p. 211) – this rings particularly and sadly true amid current complexities.

The book shares with Comfort's text an interest in networks and their role in hazard response, which is laudable for a text with potentially a wider reading audience. I found Ferguson's view, comparing the 1957 flu with COVID-19, compelling: it is plausible that "a society with stronger fabric of family life, community life, and church life was better equipped...to withstand the anguish of excess mortality than

a society that has in so many ways “come apart” (Ferguson, 2021, p. 234). Certainly parties surely have profitted from all this divisiveness, and there ought to be some shame in that; it has cost society dearly.

The book has a few issues. Hurricane Katrina, mentioned in Chapter 3, was a 2005 Category 5 hurricane in the Gulf of Mexico that came ashore in Louisiana as a strong Category 3 storm (the book mentions it as a Category 4 hurricane). There are some points where a different approach may have improved the work. While starting the text with the meaning of death makes some sense, I perhaps would not have begun with viewpoints on world religions’ perspectives on the subject, because it could be off-putting to readers so early as the book unfolds. The discussion of the classic case of the Challenger shuttle disaster in Chapter 8 has been frequently revisited in the literature, and while this retelling is not as strong as some others, it does emphasize an important point about the danger of no-bid contracting, which I found personally resonant. Certain public figures are lauded and others are not, as a matter of personal preference it seems; mostly it is not distracting. An exception is where Ferguson raises the State of Missouri’s lawsuit against China for COVID-19. The court action appears at time of writing to be ending not with a bang, but with a whimper (Keller, 2022); this is a timing-related critique, but the lawsuit seemed a silly waste of time and money initially and this point simply did not age well. Still, Ferguson rightly calls out bad leadership in COVID-19 where he sees it (even in the early stages of the pandemic, which is to his credit).

This noted, Ferguson spends entirely too much time in Chapter 11 on what is essentially a diatribe about China and some political hits that fail to land effectively; this chapter seemed so far removed from the rest of the book, which is frequently excellent on a number of levels, that it might well have been part of another book entirely. While certain points in criticism are valid, there is so much of it that it seems cheap; the result is that the chapter does not appropriately deal with the need to recognize China’s position and improve relations where possible. But it is almost beside the point because this supposedly a book about doom, and staying to the subject would have been preferred. Ferguson is a great writer and with better editing, this book could have finished strong, given an arguably exceptional start.

Vito Tanzi. (2022). *Fragile Futures: The Uncertain Economics of Disasters, Pandemics, and Climate Change*. Cambridge University Press. 246 pp. ISBN 978-1009100120 (hbk, \$24.99 USD)

Vito Tanzi’s *Fragile Futures* (2022) examines the distinction between risks (here defined as predictable future events) and uncertainties (uncertain, unpredictable events). The introductory chapter sets about in a fairly straightforward manner, showing how the world has changed from efforts to support collective needs, to redistributive policies, fuller employment, and addressing market failures. Tanzi goes on to show the dissimilarity between normal times, when public policies are typically devised, and ‘exceptional events’, where normal rules are unrealistic. It is difficult to plan for distant and uncertain needs, and still consider the need to produce optimal results in a market. Still, complexity and recent events have shown that there

is a call for government to better manage risks, which have been ignored or at least poorly addressed in the past. Like Comfort, Tanzi points out that certain governments seem to have too much faith in outside help, or that innovation will simply resolve problems experienced in crises, and there is certainly some merit in questioning this overconfidence.

The book is divided into four sections. After the introduction, part one consists of three chapters: a chapter delineating risky and uncertain events, as denoted in the thesis; a disaster taxonomy; and a chapter pointing out how nations did not prepare for catastrophes beyond wars, raising a 1970 essay by Friedman. Part two consists of six chapters, on pandemics, famines, natural disasters, atomic disasters, industrial disasters, and economic principles to guide considerations of same. Part three offers four chapters on climate change and global warming. The final part considers human needs and offers concluding thoughts.

Some aspects of the book should be well-received by readers. Part two is generally well done, with engaging discussions of disasters. These provide excellent coverage, overlapping significant events covered by other texts (including Ferguson, reviewed here, who reviewed the Irish potato famine as well). There is a tremendous problem in believing in technological infallibility and Tanzi does a great job of reminding the reader about examples where technology has failed us.

Some points of critique are warranted. Certain chapters are under-developed. The taxonomy chapter, for example, is only five pages long, and contains only the faintest representation of a classification system. Chapter 4 is similarly only five pages. Certain parts read like an opinion piece or editorial more than a scholarly text. Oddly, Three Mile Island is mentioned in the chapter on natural disasters (following a brief discussion on the Fukushima plant in Japan); there is mention that this event was not associated with major consequences, but people touched by the accident likely have a different version of this supposed truth (D'Addario, 2022). Tanzi mentions Wikipedia in the acknowledgments; Wikipedia as a resource has indeed come a long way, but this is a book from Cambridge University Press, and the book is a little thin in referencing and citations at times. Tanzi is a good storyteller, though, and the book is generally an enjoyable read – it may be appealing to a mass audience, and thus could bring some important concepts and authors (like Pigou, Coase, Hume, and others) typically found in the scholarly literature to a more general readership.

Synthesis

In calling for responsibility in conservation in the early 20th century, Gifford Pinchot had observed that “the most striking characteristic of the American people is their superb practical optimism; that marvellous hopefulness which helps the individual efficiently at work. This hopefulness of the American is, however, as short-sighted as it is intense” (1910, p. 178). It is worth considering that there is some element of the human psyche, American or otherwise, that wants to believe that technological innovation and science will always save us from ourselves, even though there is ample reason to believe that this is not always true. Frequently, humankind violates

common sense, not to mention Knightian uncertainty (Knight, 1921), in operating in a haphazard manner in areas of pure uncertainty.

The books here all address uncertainty and risk in hazards. Comfort brings scholarly care and precision to the discussion; Ferguson brings a historian's view, often with humor, and Tanzi's view gives readers much to think about in terms of particular cases. Most of the cases address historical instances of crisis, and this makes sense given our tendency to look backward in order to envisage the future. Uncertainty, though, instructs us that too much prediction based on past observances may be limiting; we may expect to see events and circumstances unfold in very similar ways and in like contexts to what has already happened, and this may not actually be the case in the future. Comfort's typology of adaptive systems is instructive and should serve as a guide to all public entities about how to improve in response to known and unknown threats – to move further along the continuum toward resilient responses in a complex world. What is necessary is planning, problem-solving and creation of community networks, and innovation in the face of evolving hazards and disasters amid increasing complexity. This involves time, effort, and resources. It is not 'nice to have' – it is necessary, and political posturing and waiting for some outside force to come and save us just does not suffice, when people, communities, and nations are suffering.

The most critical example of movement from uncertainty to clear risk is perhaps all around us in the guise of anthropogenic climate change. Human beliefs aside, perhaps it is worth just entertaining the idea that the world was not created for humankind alone (Muir, 1916), and humans would do well as a species to stop acting like the world is a convenience store or vending machine for short-term individual indulgence. Even this, for some people powerful people, is apparently asking too much. "Failure to take into consideration the sum of elements of climate change threats and implementation of resilience measures lead to catastrophic consequences in towns and cities" (Alibašić, 2020, p. 16). Evidence increasingly suggests that our world has moved entirely out of the realm of uncertainty and all the way into clear, measurable risk, if not palpable danger.¹ Whether this amounts to manageable risk, a fragile future (to employ Tanzi's title), or certain doom (Ferguson, 2021), is probably still a matter humankind can help to determine, though the clock continues to tick, our hopefulness and beliefs aside.

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Conflict of Interest The author has no conflicts of interest to declare that are relevant to the content of this article.

Informed Consent This research does not involve human participants and/or animals. Because the work does not involve human subjects, informed consent is not applicable.

¹ UN climate report: It's 'now or never' to limit global warming to 1.5 degrees. <https://news.un.org/en/story/2022/04/1115452>.

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