

An aerial photograph of Miami, Florida, showing a wide beach, turquoise ocean, and a dense urban skyline of high-rise buildings. A semi-transparent teal grid pattern is overlaid on the image, curving across the beach and buildings. In the upper center, there is a white rectangular box with a teal border containing event information.

**GRC**

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# The Interconnected Crisis - Financial, Health, Political and Climate

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# Complex Adaptive Systems (CAS)

Wikipedia defines CAS: A **complex adaptive system** is a [system](#) that is [complex](#) in that it is a [dynamic network of interactions](#), but the behavior of the ensemble may not be predictable according to the behavior of the components. It is [adaptive](#) in that the individual and [collective behavior](#) mutate and [self-organize](#) corresponding to the change-initiating micro-event or collection of events.<sup>[1][2][3]</sup> It is a "complex macroscopic collection" of relatively "similar and partially connected micro-structures" formed in order to [adapt](#) to the changing environment and increase their survivability as a [macro-structure](#).<sup>[1][2][4]</sup> The Complex Adaptive Systems approach builds on [replicator dynamics](#).<sup>[5]</sup>

The study of complex adaptive systems, a subset of [nonlinear dynamical systems](#),<sup>[6]</sup> is an interdisciplinary matter that attempts to blend insights from the natural and social sciences to develop system-level models and insights that allow for [heterogeneous agents](#), [phase transition](#), and [emergent behavior](#).<sup>[7]</sup>



# The Four Horsemen of the Apocalypse:

- Our political system
- Our economic system
- The coronavirus pandemic
- Global climate change





# Risk Managers need really to be renamed **UNCERTAINTY MANAGERS**

Frank Knight defines the difference between Risk and Uncertainty:

Risk is the potential for adverse outcomes drawn from a known distribution

Uncertainty is the potential for adverse outcomes drawn from a distribution WHICH IS UNKNOWN

We pretend that what we are dealing with is risks, but the reality is that they are UNCERTAINTIES

For all the science and technology which has been developed around the discipline of risk management, it will forever remain as much an art as it is a science



# DOOMED TO FAIL

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