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Why Are Forecasts So Often Wrong?

The nature of humanity is to seek control over our lives. We try to impose patterns on life to help us predict the future, even when those patterns may have little reality. We look to science for ways to control the world around us. In the financial industry, great effort has been spent on developing models to analyze markets and determine optimal investments. In the investment advisory industry, we strive for the idea of financial stability, of knowing your money will last as long as you do.

But it often seems that the more humanity seeks to control and understand the world, the weather, the markets, the behavior of a crowd, or even the tipping point of a social or physical change, the more unpredictable events become. Are we using the wrong data sets, the wrong assumptions? Why does life spiral out of our control?/p>

That question is as old as mankind. Peter L. Bernstein in his book **Against the Gods: The Remarkable Story of Risk**, published 1998, proposed that humanity created gods to impose order on the world. Events could be blamed on whether the gods were happy or upset and one could seek to change one's circumstances by appealing to the gods. When the gods approach failed to change reality, mathematics was invented and the calculation of risk. How many times could dice be thrown and produce certain number combinations?

By the 1900s, the early U.S. Weather Bureau believed it could pinpoint when and where hurricanes would happen (the resulting forecasts did not end well), a feat which still escapes weather scientists today. Wildfires, earthquakes, and volcanic eruptions may give telltale signs that an event is eminent, but never fail to surprise.

Part of the problem is that we are dealing with immensely complex systems. Can the flapping of a butterfly's wings cause a global change? We simply don't know, although not from a lack of trying.

A fascinating, simplistic experiment to understand complexity is the sandpile. Most of us at one time or another in our childhood built sandpiles or sand castles until it suddenly collapsed. In 1987, three physicists at Brookhaven National Laboratory in New York decided to study "non-equilibrium" systems by building a digital sandpile, adding one grain of sand at a time randomly to the pile to see at what point an avalanche would begin. (https://physicsworld.com/a/per-bak-1948-2002/) Their work showed that many phenomena in Nature are so complicated that their large-scale behavior cannot be predicted from their microscopic origin. What is the typical size of an avalanche? There is no typical number. "At any time, literally anything it seemed, might be just about to occur."

Further experiments classifying relatively flat sand areas as low risk and steeper sections as high risk showed that the more high-risk areas in the sandpile the greater the potential for an avalanche. But the consequences of the next grain were still unpredictable. It could be cataclysmic or a brief slippage. Since that time, study of the "critical state" at which change occurs has expanded into many areas, revealing our inability to precisely predict upheavals in many natural and man-caused phenomena.

Why does this matter? It reminds us that we live with uncertainty and need to accept that there are things we can control and things we cannot. For those we cannot, we need to look for ways that we can survive with the least damage and move on.

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