All Models Are Wrong

The three hardest words to say in the English language are, "I don't know." Notwithstanding the success of quantitative methods, the answers to most of life's important questions remain mysteries. Our failure to admit that we don't know can be dangerous.

Consider the case of David Viniar, formerly the Chief Financial Officer of Goldman Sachs. In August 2007, Mr. Viniar was asked to explain the sudden meltdown of several investment funds managed by Goldman. In response, he was quoted as saying, "We were seeing things that were 25 standard deviation moves, several days in a row." To put that assertion in perspective, consider an eight standard deviation event.

You would expect an eight standard deviation event to have occurred once in the history of the universe. The odds of "25 standard deviation moves, several days in a row" are incomprehensibly small. So, either Goldman Sachs was extraordinarily unlucky, or their models were wrong.

Clearly, it's better to be vaguely right than exactly wrong. To that end, there is persuasive evidence that we humans use fast and frugal heuristics that can outperform computationally intensive models, particularly in the face of uncertainty. There's even an influential theory in computer science that suggests that relatively simple algorithms are the foundations of learning, cognition, and adaptation itself.

So why on earth do we advocate the use of formal quantitative models when designing and evaluating strategy? Recall the Observe, Orient, Decide, Act cycle. We're more likely to adapt, survive, and thrive in a changing environment if we can cycle through the OODA loop relatively quickly.

Strategy is just a name we give to the act of trying to make sense of the world. It represents our attempt to observe and orient in order to help guide our decisions. Then we must act. By acting, we generate new data. That new data fuels the next cycle.

We don't think quantitative models can help us because they're right. Rather, they can help us to navigate the OODA cycle a little bit faster and a little bit more effectively.

First of all, quantitative models help us make our key assumptions about how the world works explicit and testable. Second, the very act of modeling helps sharpen our intuition. Playing with models helps us explore possible futures and the conditions under which a strategy might succeed or fail relative to our objectives. Third, models can help us know what to look for in a cluttered, chaotic world and can help us reorient a little faster than might otherwise be the case. In other words, formal models can help us learn.

However, we must work hard not to fall in love with our theories and models. It's very easy to fool ourselves. At best, our models are useful maps. They aren't to be confused with the real-world terrain.