

Fooled By Randomness

Part II

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MONKEYS ON

TYPEWRITERS

Survivorship and Other Biases

If one puts an infinite number of monkeys in front of (strongly built) typewriters, and lets them clap away, there is a certainty that one of them would come out with an exact version of the Iliad. Upon examination, this may be less interesting a concept than it appears at first: Such probability is ridiculously low. But let us carry the reasoning one step beyond. Now that we have found that hero among monkeys, would any reader invest his life's savings on a bet that the monkey would write the Odyssey next?

In this thought experiment, it is the second step that is interesting. How much can past performance (here the typing of the Iliad) be relevant in forecasting future performance? The same applies to any decision based on past performance, merely relying on the attributes of the past time series. Think about the monkey showing up at your door with his impressive past performance. Hey, he wrote the Iliad.

The major problem with inference in general is that those whose profession is to derive conclusions from data often fall into the trap faster and more confidently than others. The more data we have, the more likely we are to drown in it. For common wisdom among people with a budding knowledge of probability laws is to base their decision making on the following principle: It is very unlikely for someone to perform considerably well in a consistent fashion without his doing something right. Track records therefore become preeminent. They call on the rule of the likelihood of such a successful run and tell themselves that if someone performed better than the rest in the past then there is a great chance of his performing better than the crowd in the future—and a very great one at that. But, as usual, beware the middlebrow: A small knowledge of probability can lead to worse results than no knowledge at all.

IT DEPENDS ON THE NUMBER OF MONKEYS

I do not deny that if someone performed better than the crowd in the past, there is a presumption of his ability to do better in the future. But the presumption might be weak, very weak, to the point of being useless in decision making. Why? Because it all depends on two factors: The randomness content of his profession and the number of monkeys in operation.

The initial sample size matters greatly. If there are five monkeys in the game, I would be rather impressed with the Iliad writer, to the point of suspecting him to be a reincarnation of the ancient poet. If there are a billion to the power one billion monkeys I would be less impressed—as a matter of fact I would be surprised if one of them did not get some well-known (but unspecified) piece of work, just by luck (perhaps Casanova's *Memoirs of My Life*). One monkey would even be expected to provide us with former vice president Al Gore's *Earth in the Balance*, perhaps stripped of the platitudes.

This problem enters the business world more viciously than other walks of life, owing to the high dependence on randomness (we have already belabored the contrast between randomness-dependent business with dentistry). The greater the number of businessmen, the greater the likelihood of one of

them performing in a stellar manner just by luck. I have rarely seen anyone count the monkeys. In the same vein, few count the investors in the market in order to calculate, instead of the probability of success, the conditional probability of successful runs given the number of investors in operation over a given market history.

VICIOUS REAL LIFE

There are other aspects to the monkeys problem; in real life the other monkeys are not countable, let alone visible. They are hidden away, as one sees only the winners—it is natural for those who failed to vanish completely. Accordingly, one sees the survivors, and only the survivors, which imparts such a mistaken perception of the odds. We do not respond to probability, but to society's assessment of it. As we saw with Nero Tulip, even people with training in probability respond unintelligently to social pressure.

THIS SECTION

Part I described situations where people do not understand the rare event, and do not seem to accept either the possibility of its occurrence or the dire consequences of such occurrence. It also set out my own ideas, those that do not seem to have been explored in the literature. But a book on randomness is not complete without a presentation of what possible biases one might have aside from the deformations caused by the rare event. The business of Part II is more pedestrian; I will rapidly provide a synthesis of the biases of randomness as discussed in the now abundant literature on the subject.

These biases can be outlined as follows: (a) The survivorship biases (a.k.a. monkeys on a typewriter) arising from the fact that we see only winners and get a distorted view of the odds (Chapters 8 and 9, "Too Many Millionaires" and "Fry an Egg"), (b) the fact that luck is most frequently the reason for extreme success (Chapter 10, "Loser Takes All"), and (c) the biological handicap of our inability to understand probability (Chapter 11, "Randomness and Our Brain").