

Don't trust the numbers

by Lorenzo La Posta

Mathematics never lies, but our ability to interpret mathematical concepts accurately and honestly is at times limited. Blame our faulty, imperfect, imprecise, biased human brains! Numbers can say a lot and nothing, or sometimes can be well-trained puppets that speak just like the ventriloquist. Numbers should never be trusted blindly: challenge them, poke them with a stick and make sure you fully understand them before drawing any conclusion.

There are many examples of people not using numbers as they should.

Firstly, often people confuse "random" with "chaotic". "Random" is something that is impossible to predict with absolute certainty, because it follows probabilistic laws, whilst "chaotic" is something that is so complex it appears random whilst being actually described by fully deterministic laws. A coin toss is random, because even in an ideal setting and no external interaction, you can't know for sure whether it will be heads or tails, but you know that there is 50% probability of one and 50% of the other. However, a person tossing a coin in the real world is a chaotic, yet fully deterministic process, where in fact you can predict with 100% accuracy whether it will be heads or tails based on the force applied by the thumb to the coin, the friction with the air, the weather conditions etc... but since we can't measure with enough accuracy all these starting conditions, we can't forecast with enough accuracy the result, thus ending up treating a real-life coin toss as a random event. This inability to distinguish between random and chaotic, damages our forecasting capabilities.

And even when faced with actual randomness, people sometimes distort probabilities with perceptions. For instance, if I asked a room full of people what the chance is of extracting the number 6 at the national lottery (assume 1 to 90), after having extracted 1, 2, 3, 4 and 5, I'm sure most would tell me "It's impossible, 1-2-3-4-5-6 is too unusual a combination", or some might think "It's rigged". Well, actually, the probability is $1/(90-5)$, and the probability of the numbers extracted being 1-2-3-4-5-6 is exactly the same as six more "apparently random" like 3-14-31-60-67-84, which by the way is $(6*5*4*3*2*1)/(90*89*88*87*86*85) = 0.00000016\%$.

Another (and unfortunately not the last) commonly observed mathematical "lie" is also known as data mining, the beautiful art of cherry-picking data until it says exactly what you want it to say. An application of confirmation bias (i.e. attributing more weight to data, confirming our theory rather than disproving it), data mining attracts practitioners with its low p-values and high expected returns, then kills them with its unimplementability. Have you ever read a research paper bragging about a great investment strategy that goes something like "If you had bought stocks when their 23-days moving average was 1.5x higher than the 45.7-days trimmed mean, then you would have returned +100000% over the last 10 years"? Well guess what, run the same strategy using the 22.9-days moving average and suddenly it's only noise.

The investment world is full of these mathematical "lies" and it takes a lot of experience and focus to avoid the traps these present. Luckily, at Momentum Global Investment Management we have a team of skilled, well-rounded investors that know what to look for, that constantly challenge each other's and third parties' views and never (ever) put blind faith in anyone. We take numbers for what they are: a quantified view, a metric that was structured and described by a (sometimes random, but more often chaotic) human mind.

Global Matters Weekly

4 September 2023

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