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Bayes' Rule

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Thomas Bayes was an English Presbyterian minister and statistician known for formulating Bayes' rule. Its practical application has been very useful since it was published in 1763. It was partly responsible for cracking the enigma code during the Second World War and tracking Russian submarines during the Cold War. In the modern world, its applications stretch into different domains. It is used by pharmacologists to find new drug formulations. Netflix uses a version of Bayes' rule to make recommendations based on your viewing habits. Even your email's spam filter uses Bayes' rule to assign a probability that the weekly Tacit Thought is not spam.

So what is Bayes' rule exactly and how do we use it to improve our decision-making process at Tacit?

Imagine you were feeling unwell and went to the doctor to have a check-up. A blood test is carried out and the doctor tells you that you have a rare disease. This blood test is 99% accurate and you start to panic.

A test that is 99% accurate means there is only a 1% chance that the result is wrong – this is bad news. However, this disease you supposedly have only affects 0.1% of the population i.e. one in every thousand people. What is the probability that you have the disease?

At first, the probability that you have the disease seems very high. After all, the doctor says the test is 99% accurate so one's natural inclination is to assume that there is a 99% chance of having the disease.

Without detailing the maths, even though the blood test is 99% accurate, the fact that the disease only affects 0.1% of the population drops the odds of you having the disease down to 9% – much better than 99% implied by one blood test alone.

Bayes' rule essentially allows you to update probabilities based on new information. If you think about it, we are all Bayesian. When a child throws a ball up in the air for the first time, she has no idea if the ball will come back down or just keep going up. However, experience teaches her that the former is correct.

How do we apply Bayes' rule in making investment decisions at Tacit? While we don't compute probabilities and prior probabilities to ten decimal places, we apply the principles of Bayes' rule as a negative filter.

There is an entire class of investments that we avoid because the prior probabilities of success are very low. These include IPOs, early stage tech start-ups and pharmaceuticals, miners, oil and gas exploration companies, most airlines and car manufacturers among others. We simply avoid any fund or ETF with significant exposure to companies that have a low prior probability of success.

"First do no harm" is part of the Hippocratic Oath. At Tacit, our version of this is "First don't lose money". This may sound trite, but the avoidance of harm is the most important risk management tool. And using Bayes' rule is the rational way to approach risk management.

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