Insights, Tacit Thought | Weekly Investment Insights

Compounding Probabilities

Published on: 14 December, 2018 | Author: Investment Team

A monkey randomly hitting computer keys for an infinite amount of time will in due course reproduce all the works of Charles Dickens. This monkey would also type everything written by Shakespeare, Hemingway, Achebe, the Harry Potter stories – you name it. This may sound absurd, but it's mathematically correct and becomes obvious once we break down the numbers.

This is how it works. What's the probability that the monkey will type the letter 'A'? If the keyboard has 40 keys, the chances of typing 'A' are 1/40 or 2.5%. Not bad for a monkey typing at random.

But what are the chances that our simian author will spell the word 'APPLE'? Since the monkey types at random, there's an equal chance of striking any key and so the probability of typing 'APPLE' is:

$1/40 * 1/40 * 1/40 * 1/40 * 1/40 = (1/40)^5$ = 1 in a 100 million

Odds of one to a hundred million aren't great, but it remains mathematically possible because it's higher than zero.

Now the likelihood that the monkey **won't** type 'APPLE' is: $(1 – 1/40^5)^n$

Where n is the number of times the monkey can type the word. If the monkey is typing at random for an infinite amount of time, n approaches infinity and the probability of not typing 'APPLE' approaches zero. In plain English, this simply means that given enough time, low probability events can compound to become a certainty.

In investing, understanding how low probabilities can compound to become near certainties is very important. Imagine two companies, Company A and Company B. In any given year, Company A has a 10% chance of going bankrupt while for Company B it's 1%.

In any single year, there isn't much difference between the 1% or 10% probability. Even though a 10% chance is obviously greater than a 1% chance, they're both less than 50% and so bankruptcy is equally unlikely.

But over a 10-year period, the typical length of a business cycle, those probabilities compound. The odds of Company A going bankrupt jump to 65%. And for Company B the odds are now 10%. The difference between 65% and 10% odds is significant and Company A is now more likely than not to go bankrupt.

This is why at Tacit we avoid over leveraged companies at this stage of the cycle. After 10 years of very low interest rates, corporate debt has sky rocketed while default rates remain low. With rising interest rates and rising wages, the likelihood of defaults will inevitably increase.

In any one year, the probability of a default remains low but given enough time, it becomes a near certainty because of the compounding effect of probabilities. Our strategies remain well positioned to protect and profit from current market dislocations.

Important Information: Any views, insights, or commentary are for general information only, do not constitute personal investment advice or research, and are intended for UK residents. They may not be appropriate in all jurisdictions. While sourced from information we believe to be reliable, we make no guarantee as to accuracy or completeness. Past performance is not a guide to future results, and the value of investments can go down as well as up.

Regulatory Disclaimer: Tacit Investment Management is the trading name of TIML Limited (No. 9228395), part of Tacit Holdings Limited (No. 10611211). Both companies are incorporated in England and Wales, with the registered office at 14 Hanover Square, London W1S 1HN. TIML Limited is authorised and regulated by the Financial Conduct Authority (FCA ref. 670184) and approves and issues this communication under Section 21 of the Financial Services and Markets Act 2000. Please note, tax and estate planning services are not regulated by the FCA.