Consider this

The false pretences of precision

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Aadil Omar
Head of Equity Research

"I had studied π, that simple yet mystifying ratio of the circumference of a circle to its diameter, and found it as intriguing as ever. I hadn't forgotten how to go beyond thirty-seven decimal places, and I found it a delight to play with numbers that way." – "Life of Pi" by Yann Martel

The number 3.14159 is among the most common decimal expressions known today. It is the number produced when a circle's circumference is divided by its diameter and is used in all sorts of geometric and physics problems. You're likely to have encountered it in high school as Pi (pronounced "pie" and presented by the Greek term π). Many calculations involving Pi are reduced to the diminutive 3.14, which covers most casual applications in mathematics and physics. Pi is, however, an interesting number with some specific properties that have made it quite tantalizing for mathematicians. For instance, it is an irrational number, meaning it cannot be expressed as a ratio of two integers (although 22/7 is a commonly used fraction in approximation). Consequently, its decimal representation never ends, nor enters a permanently repeating pattern – this is the bit that so intrigues the mathematically inclined like Piscine Molitor Patel (the lead character in the story "Life of Pi").

For thousands of years, mathematicians have attempted to extend and conclude their understanding of Pi. Today its decimal representation can be calculated to many trillions of digits using increased computational power and new approaches. But we're no closer to landing the final digit or a concluding pattern; most people still use 3.14 as the number.

One can imagine that the initial search for a more complete or precise number for Pi stemmed from a practical need. There are accounts of ancient civilisations including the Egyptians and Babylonians requiring accurate approximations for building and construction. Today, computations are motivated by the human quest to break records – albeit there are theoretical-use cases in the development of new algorithms.

This little story of Pi (the number, not the character) is interesting when we think about the usefulness of precision. In the world of Euclidian geometry and other abstract theories, one can accept an almost insatiable need for precision. Real world environments are, however, far less responsive to endeavours of precision, not because being precise is not useful, but rather because precision is so difficult to arrive at in a fluid environment.

Refuge from ambiguity

During the Second World War, Kenneth Arrow was a weather forecaster for the US Air Force charged with making predictions for the coming few months. Arrow quickly realised that these long-range forecasts were effectively useless, no better than numbers pulled out of a hat. When he argued that they should be discontinued, the reply came back: *"The Commanding General is well aware that the forecasts are no good. However, he needs them for planning purposes".*

The above story of Nobel laureate Kenneth Arrow is told by Peter Bernstein in "Against the Gods" (published in 1996). The book is filled with such stories and other amusing anecdotes leading to the great human discoveries that helped tame our environment, from probability theory to the legal structures that enable risk sharing. The story may be tongue-in-cheek, but it illustrates the very real need humans have to avoid uncertainty, even if the data relied upon is precisely wrong. Even today, ambiguity is an uncomfortable space to exist in, and we seek to avoid it or at least mitigate against undesirable events (risk). This is probably because for many eons of our existence, ambiguity was no different to peril. The obvious panacea for ambiguity is precision – the greater the precision with which we can conjure an answer, the less we must deal with ambiguity.

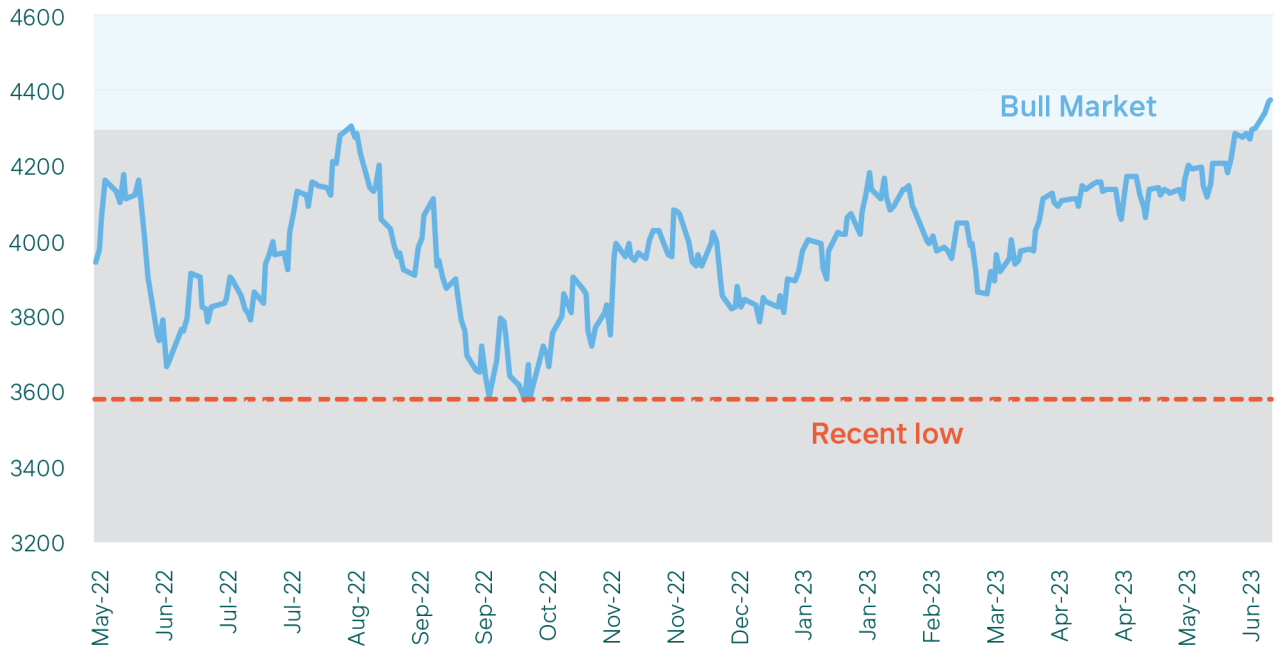
As we've seen with the example of Pi, degrees of precision are possible in abstractions such as mathematics. But what happens when precision is not viable in a given domain such as that experienced by Kenneth Arrow – do we just make up precise numbers to satisfy the yearning to move away from ambiguity?

It's officially a bull market

"It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so." – Mark Twain

I came across an amusing graph this week (reproduced here).

Graph 1: S&P500 Index



Source: Index data from Bloomberg

The original creator of the graph concludes that the S&P500 is finally in a bull market (indicated by the shaded area above 4320 points). The conclusion relies on a rather precise threshold for a bull market – namely a price increase of at least 20% from the lows of September 2022. It is amusing because the desire to "believe" this sort of precision is really tempting – you almost need to catch yourself and ask what does this really suggest? Does the market know that it has experienced a 20% price increase and that it should now be in growth mode? Or perhaps it suggests there's a critical mass of market participants who are watching this price increase and will proceed to buy up the market, driving it still higher. I'm sure there are many reasons to support the conclusion, but none of them lends to the sort of precision intended by the chart's creator. This is not reserved solely for price levels of indices; the financial community routinely uses this sort of precise language and numerical expressions when quoting forecasts from GDP projections to earnings estimates.

Nevertheless, it is worth asking why precise estimates are tempting and whether there's anything wrong with relying on them. On the former, it is cognitively easier to focus on a single number or a specific outcome than it is to consider a range of potential outcomes – it is far simpler to position a portfolio for a bull market than it is to build a risk-conscious portfolio that reflects the possibility that forecasts can (and will often) be wrong. Furthermore, being too precise can be downright dangerous, since we are lulled into suspending disbelief under false pretences. Too much conviction in the precision of forecasts closes us off to the possibility that an unlikely outcome is possible. We become blind to undesirable consequences. Unintended, this sort of precision can increase risk.

A healthy dose of scepticism

Our reluctance to exist in a state of ambiguity cannot be easily switched off, it is very much part of our internal wiring. Yet the usefulness of healthy scepticism in decision-making under conditions of uncertainty is widely known and appreciated, and we apply it liberally at M&G. It is therefore surprising that the convention across most financial research, analysis and other data remains fixated on precise numerals, where a range of possibilities might be more appropriate.

An approach that invites in and embraces scepticism to arrive at a more complete picture is not a natural calling for us. Knowledge and intention are not enough; it requires active work and sustained commitment. Nevertheless, there are a few simple structures and methodologies we can implement to arrive at better answers, such as:

- Build diverse teams inviting members to express their point of view, especially when counter to the consensus view.
- Ask yourself how the other side of the trade is justified and envision a future where things go against you.
- State the set of assumptions on which you've based your conclusion and commit to questioning them when new information becomes known.
- Identify and state any soft points in your evaluation framework so you know where the weak links are.

Many of these practises are staples in the operating procedures of high-performance teams. Incorporating them into decision-making is no guarantee that we will arrive at the correct answer, but it might save us from knowing the future with precise certainty.