

Your move, Mr Market!

Sometime around the seventh century, a new board game appeared in India. Its pieces included a counsellor, elephants, chariots, infantrymen, horsemen and a king. The game was called *chaturanga* and is the ancestor of modern chess – estimated to be played by more than 600m people around the world today. Chess has stood the test of time, lasting for centuries with few changes to the basic rules; moreover, these are so simple to understand, it is quite common for children aged five (or even younger) to learn. Yet, for



a game with simple rules, it develops such deep complexity it is hard to ever master. Players of chess have to develop strategy, persistence and the ability to quickly analyse positioning. The game is also one of 'perfect information', meaning each player has the same set of data available to them as their opponent – arguably making it free from luck, with the result dependant solely on skill.

Given the scale of players around the world, the number of decisions made during a game and the complexity involved, it is no wonder scientists have turned to chess as a 'model system' to investigate how humans make decisions and what factors influence this process most. An article in the MIT Technology Review, from June 2016, (<https://www.technologyreview.com/s/601774/data-mining-reveals-the-crucial-factors-that-determine-when-people-make-blunders/>) describes how researchers analysed a database of 200 million chess games played between amateurs and 100 million games played between grand masters, to reveal whether a player made a mistake. When identified, the databases provided a record of when each losing player made the error and what factor, or combination of factors, led to the wrong decision. The research team focused on 3 variables: the degree to which the player was under time pressure; the difficulty of the decision by examining the position on the board and its complexity; and the skill level of the player, using the universally accepted Elo chess rating methodology. Big Data analytics enabled the team to slice and dice the data set in a way that holds two of the variables constant, while allowing the other to vary and so on.

The results revealed the amount of time spent on a decision is a factor in mistakes, but only up to a point. Quick decisions were more likely to lead to an error, but after 10 seconds the likelihood of a mistake flattened out. More difficult decisions were likely to lead to errors and skill levels had a big impact in reducing the likelihood of a blunder.

Better players made better decisions. This latter result was not surprising, however, the team found evidence of an entirely counterintuitive phenomenon in which skill levels played the opposite role, with higher ranked players more likely to make an error than their lower ranked opponents. Why this should be was unclear, but the data was unequivocal in demonstrating it existed and the research team called these 'skill-anomalous' positions. Notwithstanding this, one factor was a much more powerful predictor of mistakes than the other two – the bottom line being the difficulty of the decision was most important in determining whether a player made a mistake.

Applying these results to environments beyond chess is important. For example, how does the error rate of highly skilled-drivers in difficult conditions compare with bad drivers in safe conditions? Additionally, given the discovery of the skill anomalous phenomenon, are there road conditions that make skilful drivers more likely to make a mistake than less skilful ones? Away from driving, election officials might ask about factors influencing voting decisions – for example, the complexity of information, or lack of it – will surely have a bearing (we will resist the temptation to talk about the Brexit vote and quickly move on from here).

So, has academia identified factors that influence investment returns and decisions?

The answer is a resounding yes. Extensive research, including that of Nobel Prize winners, has proven certain factors have driven returns for decades. These factors are the foundation of investing and knowing the factors that drive returns in portfolios helps choose the right mix of assets to suit their objectives and risk/reward appetite.

There are two main types of factors that drive returns. Macro factors, like economic growth and the rate of inflation, help explain returns across asset classes such as equities and bonds. Style factors help explain returns within those asset classes – growth, value, momentum, quality etc. These factors have consistently generated returns for the following three reasons; an investor's willingness to take on risk, structural impediments (such as liquidity or access) and investor behaviour is far from rational.

Understanding what factors are driving returns in certain market environments is an important aspect of risk management, as being overly exposed to any factor(s) can prove dangerous when rotations occur. This happened in October 2018, when fears about the pace of global growth and the future path of US interest rates caused a wall of money to quickly shift from being exposed to growth and momentum and be repositioned towards value, quality and low volatility factors. The pace of this change led to brutal market conditions, resulting in the sharp decline in the price of risk assets through the final quarter of the year.

Returning to the chess-based analysis, time pressures, the complexity of decisions faced and manager skill were all additional factors influencing investment outcomes through the course of this rotation. The skill-anomalous phenomenon also revealed itself, with some highly respected and demonstrably talented managers delivering the worst return periods of their careers. Hindsight is a wonderful thing and managers have been able to explain what went wrong and why – however, for us, the more important information has been to understand how they have reacted and what, if anything, has changed in their portfolios.

So what has changed in Affinity portfolios?

As ever, we have continued to keep close to our managers. We know some who have completely restructured their funds, in terms of positions held, whilst others have chosen to maintain the status quo. Others have reduced their leverage and some continue to undertake research to identify non-financial factors that may now be influencing returns and trading patterns i.e. those driven by artificial intelligence and machine learning.

One of the key tenets of our role is to find managers with the skill to quickly deploy capital when they see highly asymmetric risk-reward situations emerging. In the market conditions we are currently enduring they have to do this quickly – almost spontaneously – requiring the ability to analyse information almost at a glance. This is analogous to a chess player, where time pressure has been proven to be a key factor influencing game results. In just the same way the outcome of the player's decision may rely on incomplete analysis and plenty of missed opportunities, fund managers will get things wrong too. However, on the whole, better managers will make better decisions – and it has been encouraging for us to see quite a number of our managers making money for clients during the large sell-off we have just experienced in December.

Much like chess, investment management requires a strategy, persistence and the ability to quickly analyse positioning. However, sadly, there is never 'perfect information' and consequently there will always be some element of luck. In addition, for long-term investors, the game is never over at check mate; for us the board continually resets. Consequently, in our portfolios each holding has a role to play, each move is calculated looking many moves into the future and the strategy balances a measured attack with a solid defence.

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