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IN THE AI AGE, ACTIVE MANAGERS MAKING SMART HUMAN DECISIONS WILL WIN

Summary

One of the pleasures of getting older is that you start to have proper grown-up conversations with your children. Recently, one of my daughters started her first job, which was pleasing from her perspective and, for me, a clear improvement in the household finances! She commenced a role in investment management, and the chats we had prior to her joining her firm, and subsequently, have made me contemplate the challenges that both newcomers and experienced veterans face in the financial markets today. Specifically, the march of the machines is putting a huge spotlight on how we add value as active managers.

This paper discusses why artificial intelligence (AI)-based investing will likely become a new solution for investors, and why active managers will need to excel at being 'human' in order to be a complementary and differentiated alternative.

The Age of the machines – Why AI investing will become an alternative solution

It is difficult to escape the headlines that are increasingly dominating the press today. AI and its application through machine learning and neural networks is becoming more widely discussed. For clarity, reference to AI, which is an often ill-defined term, means the application of technology to deliver self-learning solutions that are partially or wholly unsupervised.

The complexities of implementing these new methodologies are best explained by experts in their fields and, as the author of this piece, I make no pretense that my understanding extends beyond the level of basic. Data availability is expanding rapidly and with computing power, is now more widely accessible: the catalysts for change are in place. In due course this will result in solutions with back tests or actual performance that provide the allure of predictability that many investors seek.

The MIT Sloan School of Management review recently suggested there are three signals that an industry is about to be disrupted:
1. Significant regulatory burdens
2. Customers are seeking lower costs
3. Typical customer experiences have been underwhelming

These signals certainly seem applicable to active investment management and this will contribute to the investor's desire to explore alternatives.

We also observe that the scale of capital now being deployed in the race to develop and utilise AI is immense. As consumers, we are already part of this new trend with our likes and preferences in shopping or social media helping create an increasing data set for the all-powerful tech titans. The financial sector is no different, with several leading players such as BlackRock and Sentient Investment Management publically highlighting that they are already using AI to help differentiate their offerings. In other industries the same trends prevail. Lawyers today will testify that technologies to harness legal information both quickly and efficiently are increasingly common practice. Career opportunities for legal researchers would appear to be diminishing rapidly.

One theory is that computed knowledge will one day become faster and of greater depth than human knowledge. The mastering of the ancient Chinese board came Go by Google DeepMind's program AlphaGo in 2017, is an often-cited example of how current technology can be applied to beat the best humans. Specific targeted solutions such as this indicate what can be achieved already, and would suggest that this is just the tip of the iceberg for both society and the variety of investment solutions that may emerge.

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Learning how to do machine learning – The application of AI to investment markets will have its challenges

We have already suggested that the pace of adoption of AI to deliver and enhance investment solutions will surprise many investors, just as consumer technologies, such as facial recognition, have changed how we personally use technology. It is also important to recognise that the technology is already embraced within the investment industry and indeed we use it extensively ourselves to enhance our productivity, idea generation and research modelling. Technology and human decision making can be very complementary. However, the adoption of AI to develop investment solutions with minimal human intervention is one of the possible paths the technology is leading. This raises the question of whether such solutions will deliver the returns that are desired. We don't know that answer, but would consider the following potential pros and cons of AI-based investing.

Pros

- The human brain is an unbelievable store of data. Calculating this is, of course, an educated guess, but estimates range from 1 terabyte to 2.5 petabytes, and with low power consumption to boot. However, the ability to draw on this data consistently and quickly is evidently highly fallible. Walking upstairs and forgetting why you are there is something computers don't do…
- Computers work 24-hours a day.
- Unsupervised machine learning is not based on assumptions. Traditional managers often rely on models that require assumptions in their constructs. The maths will always work, but the assumptions are often proved wrong!

Cons

- Machine learning does assume persistent relationships (the past repeating itself) and often this is not the outcome.
- Data sources are assumed to be stable and directly linked to the real world.
- The depth of data for training purposes is insufficient to compute all relevant configurations. Long history and breadth of data are still difficult to combine. Druce Vertes in his paper 'Machine learning for financial market prediction' summarised the challenge as follows: "Complex machine learning models require a lot of data and a lot of samples. In other words, good for high-frequency trading, maybe not great for asset allocation or long-term investing."
- Adoption of machine learning can have a reflexive impact on the underlying markets being targeted.
- Avoiding overfitting due to biases within available data sets is a key challenge. David Teich described this challenge in his contribution to Forbes —'*Management AI: Overfit, why machine learning isn't trained to perfection*'.

We would conclude from all of this that machine learning provides clear opportunities for replicating and indeed improving investment decisions that are based solely on financial data. Providers will no doubt learn how to better implement machine learning. The pace of this innovation will likely surpass the complacent expectations of traditional investment managers. The key caveat, however, is that in the pursuit of a better signal to noise within financial markets, there has been a key push to more breadth in data sets. This creates a potential Achilles heel, as the period where these wider data sets exist is relatively short (often less than five years) and is fully coincidental with an era within financial markets when volatility has been remarkably low. Unexpected bouts of volatility resulting from a shift to a new monetary regime (Quantitative Tightening) or widespread trade wars are not in the learning data.

These challenges aside, we do believe that AI-based investment strategies **will be viewed by managers as a viable alternative to more traditional strategies**. They will ultimately make decisions in a different way to humans. This raises the question of how traditional strategies, such as active management, can keep delivering higher returns and diversification in the face of the increasing array of alternatives or, indeed, hybrids. The key source of diversification in our view are the human elements of decision making that are behind the active solutions. Being 'smart' managers has always been hard, but there are elements that are important to making a manager more likely to deserve such an accolade.

Active managers need to play to their strengths as humans

In the late 1980s, I worked for an investment manager that was an early adopter of quantitative techniques as part of their investment process. In comparison to the sophisticated modelling done today, these would appear rather naïve, but at that time they could be described, somewhat impolitely, as the 'new shiny toy'. The predictability of outcomes that these tools promised was alluring for both clients and the investment managers who implemented them. The subcontracting of decision making to quantitative screens, however, proved to be a costly exercise during the UK recession of the early 1990s, when Mr Market proved to be a much better discounter of emerging risks (corporate failures) than historical data sets.

I was personally focused on the Asian markets at that time, where a much more pragmatic and successful approach was taken. If I applied the typical hindsight bias of investment managers, I would of course put this down to skill. The reality, however, was that narrow data sets for the Asian universe at that time, and a desire to make one's own mark early in one's career, were a fortuitous combination that allowed me to observe rather than suffer the challenges of how to combine data with human decision making.

Experiences since then — the subsequent evolution of financial markets and the pending impact of machines on investment management — are signaling that we need to focus on what drives our success as active managers. This very much does involve the inputs from technology, as we, like many asset managers, embrace it as an input into the investment process, and we see no reason why that will not continue to be the case. However, the ultimate decision making is done by the manager and not the computer. How these humans make their decisions is what we will now focus on.

This starts with the clear admission that you do not know more than the market. Information may have been scarce in the 1980s, but with an estimated 30 trillion webpages indexed by Google — and growing — this is no longer the case. Instead, how you make decisions to assess the future for the companies you invest in is essential. Context, creativity and critical thinking are key. Focusing on the human elements for making smart investment decisions is as essential as mitigating the biases and behaviours that so often limit the potential of managers. Daniel Kahneman's suggestion that we are all limited by "Excess confidence in what we believe we know, and our apparent inability to acknowledge the full extent of our ignorance" seems very applicable to investment managers.

I don't want to suggest that there is ever a simple answer to how to make smart human decisions, as clearly there is not one. The better approach may be to ask the following key questions, which we do within our own team, to help assess whether the active solutions will flourish or flounder in the era of machine-based investment solutions.

1.   AI will change everything – How can active managers adapt to win versus the machines?

Embracing change is essential as machine learning will likely be late to adapt or become compromised by changing inputs. When referring to changes we mean those that are structural and enduring over the long term. We would suggest that this is not the default setting for many as 'more of the same' is generally the easier option and admitting a prior view is wrong is not easy. Technological disruption has increasingly resulted in 'it's different this time' as often being the true statement. If there are any doubts about this, we would suggest a perusal of share price charts in newspapers and high street retailers.

The next layer of questions to ask may be:
- **Do you admit your mistakes and learn from them?** Taking risks will inevitably result in some stock picks not working and denial is not a step forward when change is the driver.
- **Do you take time to think?** Events, volatility, daily performance and questions from clients can easily encourage System 1* thinking. Critical thinking is best served as System 2* objectivity. Machines are agnostic to this question.
- **Do you embrace 'data light' changes?** By data light we are referring to changes where new factors are just not included in historical data, e.g. Middle East war, or the duration of impact is very long term, e.g. demographics, or shifting consumption patterns by Millennials.

(* Daniel Kanehman describes two types of thinking: "System 1" is fast, instinctive and emotional; "System 2" is slower, more deliberative, and more logical.)

2.   Active managers can be 'smart', but are often undermined by their fallibility – Do your active managers have a culture that maximises their strengths versus inevitable weaknesses?

The performance of the average manager clearly suggests that the promise of talent is often not fulfilled from a client's perspective. Investment managers are invariably confident about their own abilities and can obsess about being right and never wrong; about looking good rather than bad, and seeking affirmation wherever possible that their self-confidence is justified. These are bad habits and key sources of the fallibility we wish to avoid. The following are areas we would focus on as being key to mitigating these typical behaviours:

- **Can you disengage your ego?** Listening and learning from others is very different from only listening to inputs that confirm your own views. Admit at the outset that you will not get everything right and that these mistakes are yours. Mistakes are valuable learning opportunities that should not be feared.
- **Do you play your cards close to your chest?** Un-cross the arms and be completely open to questions from others as it will help you form better opinions. In life generally, you are less likely to trust someone who is guarded – why should your clients or colleagues feel any different?
- **Do you think you know more?** Even if this was the case historically, computer recall will always be superior in the future. Smart decisions about the future typically involve a confluence of factors that the market doesn't yet link or appreciate. Educated guesses are essential and they are not the same as 'knowing' the way computers will do.

3.   Connectivity enhances creativity – Does your active manager embrace teams over individuals?

Just like picking stocks, picking managers is not easy with self-promotion and marketing machines muddying the decision-making process. We sometimes find that explaining that we manage client money on a team basis is like fitting a square peg in a round hole. 'Star' fund managers are often seen as easier to promote assuming clients will identify more with individuals. For us, this invariably results in the very behaviours we wanted to avoid in the prior question being enhanced rather than diminished. Put simply, we are of the view that teamwork and collaboration help diminish the bad biases that exist in all of us.

To gauge whether the active manager is defined by teams rather than individuals, we would ask the following:

- **Are you students of Socratic learning?** Developing great ideas is more important than owning ideas. Testing hypotheses on your colleagues can be the easiest and most powerful driver of testing and iterating investment ideas. Finding inputs and connections that you didn't consider can be key to Bayesian decision making.
- **Is there a meritocracy for best ideas?** The best argument is what should win out, but if they invariably get trumped by the views of a star portfolio manager, all sorts of biases can ensue. If there is no open mindedness, the ideas that solely fit the biases of the decision maker can become the norm.
- **Who owns uncertainty?** Making the call on picking stocks can be hard, as the best ideas often have wrinkles, and dispute about the outlook can be a notable source of excess return. Unanimous decisions-by-committee will often result in safe (and lower return) options dominating. Getting the balance between the autonomy of individual calls and how they interplay with overall portfolio decisions is important.

Conclusions

Expect managers to embrace the use of AI to increasingly deliver the whole investment process for clients. As these solutions evolve they will learn and improve, and become a different and increasingly competitive alternative to active management. Such solutions will likely have challenges and setbacks, particularly when disruptive forces accelerate and dominate, but this will not stop their adoption by some managers as an alternative source of returns.

Successful active managers may increasingly utilise technology, but it is their smart human decision making that is the key source of consistent excess returns over the long term. Identifying these key skills is one of the challenges in selecting managers. With the march of the machines, staying in this winning group will require being true to the human based skills that are an essential part of delivering these returns. Attempting to out-compute the computers will more likely result in correlated mediocrity.

In summary, success as an active manager will require a willingness to be open minded to changes in investment markets, to adopt the right critical thinking as individuals and within teams, and to wisely use technology as a component of the investment process. By doing so, active returns will more likely be delivered and be less correlated with new the AI-based investment solutions that will emerge.

Reference reading

This paper has been written as an opinion piece about how active managers should focus on human-based decision making as a key component of future success. Empirical evidence to prove the range of attributes required is of course difficult and would likely be affected anyway by the reflexive nature of AI-based investment strategies as they evolve. Hence I have listed some of the reference reading, that when combined with my own intuition and experiences, helped form the overall opinion piece.

1. Daniel Kahneman, *Thinking fast and slow*, 2011
2. David Jessop and team, UBS, *Machine Learning in Finance – Limits and potential*, 2018
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4. Megan Beck and Barry Libert, *Three signals your industry is about to be disrupted*, MITSloan Management Review, June 11th 2018.
5. Edward D Hess and Katherine Ludwig, Humility is the new smart: Rethinking human excellence in the Smart Machine Age, 2017
6. Kevin Kelly, *The Inevitable: Understanding the 12 technological forces that will shape our future*, 2016
7. Druce Vertes, *Machine Learning for Financial Market Prediction –Time Series Prediction with Sklearn and Keras*, Alpha architect, June 2018
8. David A Teich, *Management AI: Overfit, why machine learning isn't trained to perfection*, Forbes, January 2018

Important Information