AI: An intelligent active manager's odyssey

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In spite of Artificial Intelligence's transformative potential, the investment management industry has been slow to invest in and use AI compared to other developed industries. In this paper, Jack Gray explores the journey of AI, a threat to active management that comes quickly behind the current shift to passive investment strategies.

Active management and the demand for hope

Much ink and some blood has been spilt over passive ETF's supposed existential threat to the active management of securities and assets. While roughly a third of all global equity management is now passive, the threat itself is over-stated. Active's survival, though in a much reduced form, is assured by the eternal demand for *hope* – hope of beating the market, hope of being above average, hope of not missing out. Supply to meet that demand flows willingly from active managers' engaging and sometimes insightful narratives about exciting stocks, often hyped by new technologies.

That said, active *is* exposed to a deeper and longer-term threat, one that might just "sweep it away."[1] The opening gambit is Blackrock's intention to replace all/many/some *traditional active* equity processes (of which Blackrock has $300b AUM) with *quantitative active* processes ostensibly because quant can generate alpha as successfully as traditional and at far lower cost. For many this is an old story.[2] However, scale and market presence threaten to transform Blackrock's initiative into an imperative for traditional managers.

A more substantial threat is lurking: AI

But 'going quant' will provide only short-term solace. Lurking under the rubric 'quant' lies the more substantial threat of *Artificial Intelligence/ Deep Machine Learning*.

The threat of AI to routine process-driven jobs is manifest even after discounting the considerable hype. But AI also threatens the jobs of lawyers, radiologists and others demanding advanced cognitive skills with its ability to recognise patterns and images, to learn, to *improve* its own algorithms. In the investment management industry, both back and front offices are threatened. Eventually, AI will probably be capable of 'thinking' about, crafting, writing and even *delivering*[3] engaging, insightful and empathetic narratives. Then AI too will sell hope.

Is this scenario the ultimate disruptive one where machines make (almost) all investment and commercial decisions, pitch for business and report to clients, or does it belong in the SciFi fantasy world? Doubtless some is fantasy, but less than we might hope for. We tend to overestimate the short-term effects of new technology while underestimating the long-term effects. Campbell Harvey, a respected finance professor predicts that "in the end it will be a good thing for investors" if human judgement is usurped by machine judgement.[4] When Amazon enters investment management that harsh reality may well emerge from picturesque fantasy. Indeed, Autonomous Learning Investment Strategies (ALIS) have been with us for some time[5] though as yet they are not capable of crafting new insights or of selling hope.

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1 The Greek C P Cafavy's poem Things Ended (see the Appendix) highlights how easily we miss more damaging threats.

2 Most traditional managers rely on some form of computer-driven quant processes in portfolio construction and trading. Since 2010 the AUM of quant hedge funds has doubled to nearly $1t, while according to J P Morgan orders placed by computers now account for 60% of US trading volume, double the figure from a decade earlier.

3 Some AI programs already pass Turing's Test in which interlocutors fail to distinguish between answers from a human and a computer. https://en.wikipedia.org/wiki/Turing_test

4 https://www.nytimes.com/2018/01/12/business/ai-investing-humans-dominating.html

5 See for example www.MOV37.com. For a brief review and a simple checklist for selecting an AILS manager see https://blogs.cfainstitute.org/investor/2018/01/08/autonomous-learning-investment-strategies-alis-what-a-long-strange-trip-its-been.

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AI's co-existence with active managers

The history of technology suggests that some form of traditional active management will survive the rise of machines[6]. The new often *co-exists* with the old rather than fully replacing it … quills and slide-rules notwithstanding. Co-existence will advance through *human-machine interaction* where human and machine in turn leverage off the other's insights in a process of continual improvement. To thrive in that world active managers will need as yet unknown skills.

For a while at least, a traditional active approach should thrive. Traditional is likely to outperform machines in managing highly concentrated portfolios and alternative assets, especially in heterogeneous domains where idiosyncratic risk is high and tacit security-specific knowledge is critical. To the extent that AI learns through data-mining, the relative scarcity of data in those domains favours humans. Further, much alternative investing lacks robust, predictive theories which again favours human minds. However, both advantages will likely fade as AI overtakes the human ability to develop intuitive knowledge and insights *without* much data and *without* theories. When machines can formulate and test their own explanatory hypotheses traditional active management will raise the white flag. That fearful scenario lies ahead, as currently AI/Deep Machine Learning is poor at generalising specific information and can't provide explanations, theories, or reasons to justify or explain its decisions[7]. Currently it is a very black black-box[8] and even blacker than the black-box inside active managers' heads.

The investment management industry has typically been slow to invest in AI

In spite of AI's transformative potential, the investment management industry has been slow to invest in the necessary R&D, and even slower to use AI[9] compared to other developed industries. For instance, investing fails to rate a mention in Stanford University's *AI Index*, https://aiindex.org/. Failure is likely explained by the comfort induced by persistently high margins, by the industry's capital-light structure which inhibits capital-intensive R&D, and by its much-vaunted essence as a human relationship-driven business. If Blackrock's initiative trends the consequent lower margins should encourage the development and use of AI in active investment management.[10]

Embracing the opportunity

Unsurprisingly some hedge funds, with their greater institutional and intellectual freedom (and a few Robo Advisers driven by wafer-thin margins) have been early adopters of AI and not just to uncover previously hidden factors in capital markets but also to improve human insights and decisions.[11] The CFA has taken a positive step by offering teaching modules in AI and Big Data.[12] Perhaps that's a straw in the wind. Perhaps the investment industry will sacrifice its long-protected comfort and embrace the opportunity and risks afforded by on-going advances in Artificial Intelligence and Deep Machine Learning.

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6 Were history to repeat, threatened managers will organize Luddite-like resistance and destroy the machines, metaphorically at least.

7 The dark secret at the heart of AI', MIT Technology Review, May/June 2017. https://www.technologyreview.com/magazine/2017/05/

8 The world chess champion Alpha Zero, given only the rules and aim of the game, learns to play chess by playing against itself many times. As yet it can't explain or justify its moves and tactics.

9 Financial Times, 2/12/2017. https://www.ft.com/content/e2645d5e-d67e-11e7-8c9a-d9c0a5c8d5c9. See also https://www.bloomberg.com/news/articles/2017-12-14/world-s-biggest-pension-fund-sees-ai-replacing-asset-managers

10 As MiFID II bites, sell-side analysts' reports should be an easy target to be 'AI'd'.

11 www.wsj.com/articles/the-future-is-bumpy-high-tech-hedge-fund-hits-limits-of-robot-stock-picking-1513007557. See also The Economist, December 9, 2017, p66.

12 www.reuters.com/article/us-investment-tech-cfa/cfa-exam-to-add-artificial-intelligence-big-data-questions-idUSKBN18J2R4

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Appendix

Things Ended

C P Cafavy

Engulfed by fear and suspicion,

mind agitated, eyes alarmed

we try desperately to invent ways out,

plan how to avoid the obvious danger

that threatens us so terribly.

Yet we're mistaken, that's not the danger ahead:

the news was wrong

(or we didn't hear it, or didn't get it right).

Another disaster, one we never imagined,

suddenly, violently descends upon us,

and finding us unprepared – there's no time now –

sweeps us away.

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