"Man and Machine" or "Man vs. Machine?"

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FOREFACTOR

There is no denying that man uses machines more today than ever before. It is safe to assume that this trend will persist as long as machines and their programs continue to increase efficiency and effectiveness and decrease manual errors and workload.

It would be difficult to name an industry that has not adopted the use of a machine in some way. But, in the financial services industry specifically, the phrase "Man and Machine" is used to describe a man working *with* a machine as a tool that aids in trade execution and investment.   In this scenario, we are reminded that man creates the machines and subsequently programs these machines to do what they want.

However, when you insert the word "versus" so the phrase becomes "Man vs. Machine," the connotation shifts more towards a debate surrounding subjects such as who or what trades better, who or what makes better investment decisions and ultimately, whether machines will take over the role of man in the investment community.

Nonetheless, the most important questions remain. What is the impact of "Man" and what is the impact of "Machines" on achieving a positive return in portfolios? Is the return greater when man makes the decisions, when the machine makes the decisions or when both are involved (e.g. quantitative portfolios where models are designed to serve as input into the investment decision or an algorithm for trading as opposed to a manual execution)?

Irrational Behaviour – is it ever acceptable?

Of course, in the non-trading and investing world, irrational behaviour is a fact of life; irrational behaviour is impossible to eliminate without the use of computer algorithms or delays in receiving information.

For example, consider the still discussed U.S. flash crash of May 2008. The information about that crash took almost a full minute to reach the Canadian marketplace and consequently, traders and portfolio managers did not react. Therefore, Canada engaged in no irrational reactions or behaviour and as a result, did not have a significant flash crash.

In the scenario above, a human being made assumptions and determined outcomes with the use of algorithms or robotics from the onset. Given that the human race has yet to gain access to computers with deductive reasoning, or artificial intelligence as most call it, the reality is the programmers in the investment community will continue to base their decisions on the past, as they have no crystal ball for the future.

Even if a trader is using an algorithm, he or she still has the ability to influence that algorithm – the only way to remove the human element from the equation is to eliminate it from the trading and investing process altogether.

Infallible Machines

Contemplate this: if humans were removed from the investment cycle, the ability to maintain the ongoing relevance of algorithms and models for portfolio allocations would be lost. Until an artificial intelligence that can adapt and update the algorithms according to market and economic conditions, and is therefore as or more intelligent than humans, is discovered, the 'man' part of the debate will always remain relevant.

Machines, however, are not infallible. Computers break down and software programs develop glitches and it is more likely that the creator (man) is blamed for such blunders. Regardless, until computers can create themselves and develop the programs necessary to operate, the debate on whether man is better than machine is moot.

Evolution

The word *cybernetics* was first used to signify the governance of people in the context of "the study of self-governance" by Plato in *The Laws.* As the buy-side continues to become more involved in the trading process, this concept becomes further applicable to them. In the past, it has been the broker dealers that have been held responsible for governing themselves while the buy-side held on to the fact that regulators legally deemed the broker dealers responsible not only for their own errors but for buy-side errors as well.

The cybernetic ideas of Norbert Weiner defined cybernetic theory for those that followed in his footsteps to further evolve the concept. At its most simplistic level, cybernetic theory describes how information moves within a system. This theory is perhaps most relevant to the financial markets and how they behave from a behavioural and technological standpoint.

In a centrally controlled system, information flows out and back from a central point (e.g. a car's cruise control) – while in a cybernetic "distributed" system (like the internet), every "node" is connected to every other "node," making information difficult for one authority to direct. A cybernetic system is self-organizing, revolving primarily around information relationships; if one route is blocked, the information simply reroutes.

Industry Opinion

Based on Forefactor's recently released research with the buy-side, 83% of the investment community that trades in Canada uses a trade management system, such as an order execution management, execution management or order management system. This technology is a first step in the evolution toward algorithms. The use of algorithms for trading in Canada has reached 55% of total trading and the average number of algorithm vendors used is 3.3. However, the study also indicates that Canadian-based respondents use significantly fewer algorithm vendors than the US/UK when the sample is reviewed by country.

If one were to examine the amount of volume traded with an algorithm it would show that the buy-side is trading an average proportion of 49% algorithmically through direct market access (DMA).

To play devil's advocate and touch on the point made by many market participants (whose jobs would be at stake should machines increase their usefulness) – man and his irrational emotions create volatility in the marketplace, which in turn provides the industry professionals with the ability to generate profit. A stable market fluctuates based on company performance and economics while a volatile market, which has been artificially created by unpredictable and emotional reactions to qualitative events, is more challenging to navigate. That being said, it begs the question, which scenario is better?