By Johan Fourie

HUMAN BEHAVIOUR

How the world of finance evolves

We are biological beings, and not as rational as we might think. What does this mean for our interaction with markets?

Why do stock markets tend to be depressed during winter? Why do investors with too little emotional response (or too much) tend to be less profitable than those with just the right amount of emotion? Why do traders tend to make more money on days when their levels of testosterone are higher than average?

In a fascinating new book, Andrew Lo builds on the corpus of behavioural science research to outline a new theory of financial markets. His basic point: *Homo economicus* is dead. The hyper-rational human who always optimised every decision, most famously portrayed in the Efficient Markets Hypothesis of Eugene Fama that has ruled the field of finance at least since the 1980s, does not exist.

Lo's new book, *Adaptive Markets: Financial Evolution at the Speed of Thought*, explicates his Adaptive Markets Hypothesis, first proposed in 2004 as a substitute for the Efficient Markets Hypothesis.

In short, the Adaptive Markets Hypothesis accepts that humans are biological beings, and that our biology limits our ability to optimise every decision as the Efficient Markets Hypothesis predicts. Most importantly, though, our "irrationality" is not random. This means that we consistently make the same "mistakes", something that behavioural scientists have known for quite some time. One of these mistakes, for example, is that we often link events together because they happen to occur close to one another.

Andrew Lo
Professor of finance at the MIT Sloan School of Management

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Lo explains: "We humans are not so much the 'rational animal' as we are the rationalizing animal. We interpret the world not in terms of objects and events, but in sequences of objects and events, preferably leading to some conclusion, as they do in a story."

Telling stories is one way we try to make sense of the world, even if those stories are sometimes false. We do this because, given the environments that we encountered, this was the most evolutionary successful behaviour. But that has consequences: If our environment change, our biological decision-making processes might not be equipped to deal with the new environment.

In Lo's words: "'Rational' responses by *Homo sapiens* to physical threats on the plains of the African savannah may not be effective in dealing with financial threats on the floor of the New York Stock Exchange."

Often the real world is not very different from the survival-of-the-fittest world our ancestors encountered on the African plains. Many times, humans do optimise their behaviour. This is why the Efficient Markets Hypothesis could hold for so long, treating "irrational" behaviour as random outliers that will be averaged out in the marketplace.

But as Lo demonstrates, often humans (and by implication traders) behave "predictably irrational", reacting to fear systematically different than to reward, for example, and opening opportunities for windfall profits on the financial markets. That's why some famous investors, accounting for these predictably irrational heuristics, can be consistently successful.

The good news is that we are not like other animals. We don't have to wait for evolution to mould us to our environment through natural selection. We have the ability to learn and adjust through trial and error. High-frequency trading is a great example: speed is everything in financial markets, and automated trading programmes have replaced specialist human traders who are just too slow to recognise and respond to the predictably irrational human errors.

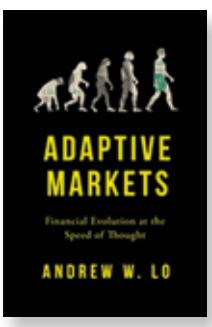
But even this is changing, says Lo: "At first, these high-frequency traders made windfall profits, since human specialists were sluggish and inefficient in comparison. However, there ultimately came a point where high-frequency traders were mainly competing with one another. To succeed in this financial arms race, high-frequency trading firms had to invest in faster and more expensive hardware."

At the same time, however, these firms were scouring the market for any trace of "juice" that might be left. In a very short amount of time, high-frequency trading was pushing against its natural evolutionary limits. It had unexpectedly become a mature industry, with low margins on trades and low overall profits.

High-frequency trading is now on the decline, as more and more exchanges start implementing "no high-frequency trading zones". The environment is changing, and high-frequency traders who don't adapt will perish.

The book explains why the Efficient Markets Hypothesis was so appealing, why earlier attempts to use evolutionary thinking in finance never caught on, and what this new theory might say about the future of finance.

It also has a cautionary word about how we train the next generation of finance gurus: "For the mathematically trained economist, it's sometimes difficult to think in evolutionary or ecological terms, but sooner or later, this way of thinking will be domesticated (another biological metaphor), and will become another standard tool for economists to use, just as molecular biologists use it today."



Just like the finance industry employed mathematically inclined engineers and physicists in the past few decades, perhaps biology will be the training of choice for the next generation of investment firms. Perhaps. What we do know is that the environment is changing, and that traders will have to adapt too if they are to survive, and thrive. As Lo explains: "An evolutionarily successful adaptation doesn't have to be the best; it only needs to be better than the rest." Let the games begin! ■

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