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NEW THEORETICAL LIGHT FOR TECHNICAL ANALYSIS

by Kian-Ping Lim

Does technical analysis have any solid theoretical foundation in the academic literature? The author argues in favour of an important new theory to underpin TA - Adaptive Markets Hypothesis.

The Efficient Markets Hypothesis (EMH) has been the guiding light in the field of economics and finance for the past few decades. So much so that any findings that contradict it have been dismissed as statistical anomalies.

Yet the theory no longer receives resounding acceptance among seasoned practitioners who continue to explore ways to exploit predictabilities in the stock markets. One of the techniques widely employed by professionals in the investment world is technical analysis - a practice dismissed by disciples of EMH who hold on to the belief that patterns observed in the past occurred by chance.

In recent years, the pendulum has swung in favour of professional analysts with more and more evidence of stock market predictability being reported in the academic literature. In fact, in 1999, John Cochrane, professor of finance at the University of Chicago, labeled stock market predictability a 'new fact in finance'.

The search for a theoretical explanation for predictable patterns has been a challenging one. Up to now, the field of behavioural finance has been most successful in providing plausible explanations, to the extent that behavioural finance has proved a natural academic ally for technical analysis. It now seems normal to marry the two together with the idea that charts are the graphical representation of market psychology.

However, EMH still survives. This is

because evidence reported in the academic literature does not lean cleanly towards either side - behavioural or classical economics - and this has further hardened the resolve of proponents on both sides.

In an article that appeared in the September/October issue of *The Technical Analyst*, I attempted to offer reconciliation to the controversy between proponents of EMH and advocates of technical analysis. Using daily data of South Asian stock market indices, I demonstrated that there were times when the markets moved randomly and other times when the market moved in a significantly non-random and dependent pattern. In this regard, during those periods when the markets moved non-randomly, it was possible for investors to devise a trading rule to exploit these linear and non-linear dependencies to earn abnormal rates of return.

The statistical exercise I carried out revealed that the mixed evidence on efficiency/ inefficiency documented in the academic literature was not surprising. I found that there were times when the market was efficient and times when the market was predictable. Using the same analysis on the same market, it could be seen that different time periods gave contrasting results. The main message that emerged was the importance of market timing strategies, since predictability is mainly a short-horizon phenomenon with predictable patterns appearing only sporadically.

Though my work threw important light on the controversy between EMH and technical analysis, it lacked any solid theoretical framework to justify the findings. But subsequent to my study, a new theory has emerged that fills this theoretical void - the "Adaptive Markets Hypothesis" (AMH), proposed last year by Andrew Lo, professor at MIT Sloan School of Management. The potential importance of this theory was underlined by its publication in a special 30th anniversary issue of the *Journal of Portfolio Management*.

The theory is heavily influenced by recent advances in the emerging discipline of "evolutionary psychology". This new paradigm, which is an alternative to the classical EMH, is based on the principle of evolution where competition, adaptation and natural selection determine the efficiency of markets and the waxing and waning of financial institutions, investment products, and ultimately individual fortunes.

AMH offers a number of concrete implications for the practice of portfolio management. Firstly, contrary to classical EMH, profit opportunities do arise from time to time in AMH. The very existence of active liquid stock markets implies that profit opportunities must be present. This is not surprising - researchers have long argued that perfectly efficient markets are an impossibility, for if a market is perfectly efficient, there is no profit earned by information gathering, in which case

there would be little reason to trade and markets would eventually collapse.

Thus, in practice, there must be sufficient profit opportunities to compensate investors for the cost of trading and information gathering. From an evolutionary perspective, these predictable patterns should not persist over time because they will disappear after identification and exploitation by investors, but new opportunities are continually being created as groups of market participants, institutions and business conditions all change.

Lo presents an illustration of this process:

"...those investors who experienced substantial losses in the technology bubble are more likely to have exited the market, leaving a markedly different population of investors today than four years ago. Through the forces of natural selection, history matters."

Hence, contrary to the inexorable trend towards higher efficiency as predicted by classical EMH, AMH implies considerably more complex market dynamics, with cycles, trends, panics, manias, bubbles, crashes, and other phenomena that are routinely witnessed in natural market ecologies.

To support his point, Lo computed the rolling first-order autocorrelation of monthly returns of the S&P Composite Index from 1871 to 2003, a method for determining how much interdependency there is in a price series. According to classical EMH, the first-order autocorrelation coefficients were expected to take on larger values

during the early part of the sample and become progressively smaller in recent years as the US equity market became more efficient. Against the expectation of EMH, the graphical plot instead



demonstrated that the degree of efficiency varied through time in a cyclical fashion, with the surprising result that the market was more efficient in the 1950's than in the early 1990's - a finding consistent with AMH.

Moreover, it's possible that Lo himself underestimates the level of predictability in prices. His study assumes that a lack of autocorrelation means a price series is unpredictable, yet the

method he employs is only capable of detecting linear dependencies. In this regard, the (windowed-testing) procedure that I and others have used is superior because it can also uncover

non-linear dependencies - this is the statistical equivalent of being able to spot chart formations such as head-and-shoulders.

Secondly, investment strategies will wax and wane, performing well in certain environments and performing poorly in others. Specifically, AMH implies that investment strategies undergo cycles of profitability and losses in response to changing business conditions, the number of competitors entering and exiting the industry, and the type and magnitude of profit opportunities available.

As such, the Adaptive Markets Hypothesis provides a solid theoretical basis to explain why there appears to be times when technical analysis works and times when it does not. This calls for active management strategies and justifies the application of technical techniques in stock market investment - the success of which depends on the ability to time the market.

AMH could well be the theoretical foundation that technical analysis has been missing. Only time will tell whether it can make important inroads into the financial mainstream.

Kian-Ping Lim is a lecturer in the Labuan School of International Business and Finance, Universiti Malaysia Sabah, Malaysia.