

reliable substitute for actual experiments is thus becoming a reality. ■

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ECONOMICS

Predicting asset prices

The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel was awarded to Eugene F. Fama, Lars Peter Hansen and Robert J. Shiller, whose empirical analysis of asset prices has shaped our understanding of how markets work (see figure).

EFFICIENCY AND VOLATILITY

by Christopher Polk

Fama's efficient market hypothesis (EMH) argues that competition among investors makes the return from using information on stock prices commensurate with the cost of that information. Thus, if costs are zero, prices correctly reflect all relevant information¹. According to this hypothesis, if we could easily predict that stock prices will rise tomorrow, we would all buy today, such that prices would in fact rise today until they reflected the information we had received. Tests by Fama in the 1960s found that short-run returns were mainly unpredictable, which is consistent with a market that incorporates information efficiently.

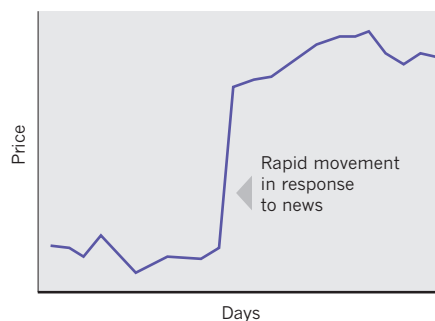
Fama emphasized that the EMH was not directly testable; one can only test a joint hypothesis of the EMH and a model detailing the way in which expected returns are set. If, say, small-company stocks generally outperform large-company stocks, this might not indicate that the pricing of small companies is inefficient, but rather that small-company stocks are riskier and hence their investors demand high expected returns as compensation².

In 1981, Shiller showed that historical prices were excessively volatile relative to their future realized value³. This suggested that although prices respond quickly to information, they change for other reasons as well. Shiller interpreted this volatility as resulting from investor sentiment. Subsequent work linked excess volatility to predictable variation in long-run returns; short-term predictability was later found as well.

These findings presented a serious challenge to the EMH, but Fama's joint hypothesis allows a possible explanation: time-varying

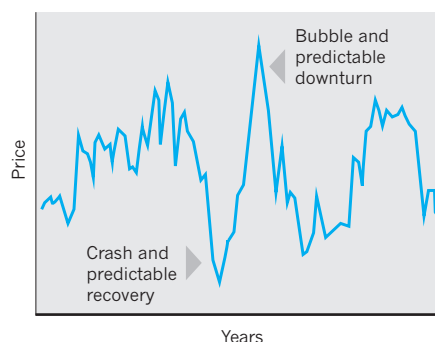
SHORT-TERM UNPREDICTABILITY

Fama showed that asset prices are extremely difficult to predict in the short term.



LONG-TERM PREDICTABILITY

But Shiller showed that there is greater predictability over the longer term, and interpreted this finding as market inefficiency resulting from investor behaviour.



TESTING THEORIES

Hansen's statistical techniques for testing economic theories highlighted the attractiveness of stocks to investors who can tolerate risk.



expected returns may be due to time-varying risk and/or risk aversion. Understanding the sources — rational and sentiment-based — of predictable variation in returns is at the heart of modern financial economics.

EMPIRICAL FINANCIAL ECONOMICS

by John Y. Campbell

Financial markets continually generate vast quantities of data on asset prices. Fama, Shiller and Hansen have led an effort, over almost 50 years, to use these data to better understand the economy and investor behaviour.

Fama observed that the return on any risky financial asset is the sum of a 'required' return that a rational investor expects to earn and an 'unexpected' return driven by the arrival of news. He noted that, over short time periods, the volatility of unexpected returns is much greater than any movement in the required return, and hence that short-term price movements accurately reflect the news hitting the market at each point of time.

Hansen built on Fama's insight, developing a powerful statistical method to extract from asset returns information about key properties of the economy, such as investors' average aversion to risk, without having to model other features of the economy that are irrelevant to the problem at hand^{4,5}.

Shiller pointed to data indicating that large price swings result from the accumulation of movements in required returns over long periods of time, and that unexpected returns reflect not only news about the future payments that assets will make, but also unexpected changes in the required return⁶.

Together, their work has definitively shown the value of empirical research in understanding price formation in financial markets. Fama and Shiller have also used financial data to construct indexes that summarize the movements of broad categories of assets, such as groups of stocks with similar characteristics and houses in the same city². ■

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