

READ YOUR SHARPE AND MARKOWITZ

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In Jerome Lawrence and Robert Lee's classic play *Inherit the Wind*, based on the 1925 "monkey trial" in which John Scopes was accused of violating Tennessee law by teaching evolution, creationists rally support for their cause by displaying a banner saying, "Read your Bible!" Henry Drummond, lawyer for the defendant, wishes there were also a banner proclaiming "Read your Darwin." If you're going to argue for a cause, Drummond seems to be saying, you'd better know it backwards and forwards. And if you're going to try to overturn somebody else's views, you'd better understand those views even better than your opponent does!

Here, I'll argue that the great innovations of William Sharpe and Harry Markowitz and the other creators of classic finance theory in the 1950s and 1960s are worth studying very closely — even though some of their findings aren't exactly right. Classic finance forms a base case or null hypothesis against which empirical facts, new theories, and conjectures can be tested. Without it, we are lost. With it, we have a set of very useful guideposts, a little like Newtonian mechanics in physics — we know it's not exactly right but use it, where we can, because it is so useful. We need to read our Sharpe and Markowitz.

WHAT'S THE MATTER WITH FINANCE TODAY?

The current state of knowledge in finance — and particularly investment management — is confusing, not only to many newcomers but also to some of us who have been in the business for decades. The efficient market hypothesis (EMH), a cornerstone of classic finance theory, says that security prices reflect all available information and that it's impossible to beat the market consistently. The EMH is on the ropes. Most finance practitioners make their living by violating it. They find inefficiencies in the market and exploit them, for themselves and for their customers, and charge high fees for doing so. This would be impossible if the market were as efficient as academics believed a few decades ago.

The related Capital Asset Pricing Model (CAPM), and the portfolio selection technique known as Markowitz optimization, are also facing challenges. A large body of evidence shows that the CAPM is not exactly right — it does not give very good forecasts of security returns, conditional on knowing what the market return is. Low-risk (low "beta") securities seem to beat high-risk ones even though CAPM predicts the opposite. Markowitz optimization, which is a way of putting numbers around the long-established practice of diversification, has been blamed for the failure of diversified portfolios to perform well in the crash of 2008.

A SPLIT NOBEL

Meanwhile, in Sweden, the Nobel Prize committee has added to the confusion by splitting the 2014 economics prize between Eugene Fama, a leading advocate of the EMH, and Robert Shiller, who has devoted much of his career to overturning it. (Lars Hansen, an econometrician whose work has formed the foundation for much of the recent testing of theories in finance, also shared the prize.) Is the Nobel committee saying that both Fama and Shiller are right? That the EMH is valuable and so is the body of research casting doubt on it?

You bet. That's exactly what they're saying. But you might be wondering how two contradictory propositions can both be right.

FIRST, WHAT'S A THEORY?

We're most accustomed to hearing the word "theory" used in connection with the natural or physical sciences: the theory of gravity, theory of evolution, and so forth. In the "hard" sciences, according to the American Association for the Advancement of Science,

A scientific theory is a well-substantiated explanation of some aspect of the natural world, based on a body of facts that have been repeatedly confirmed through observation and experiment. Such fact-supported theories are not "guesses" but reliable accounts of the real world. The theory of biological evolution is more than "just a theory." It is as factual an explanation of the universe as the atomic theory of matter or the germ theory of disease. Our understanding of gravity is still a work in progress. But the phenomenon of gravity, like evolution, is an accepted fact.¹

HOW DO THE EMH, MPT, CAPM FIT THIS CRITERION?

In this context, EMH is a hypothesis, not a fully developed theory. It is testable and, when we test it in detail, we find it wanting — markets are not perfectly efficient. In spite of this, EMH is a valuable hypothesis because it focuses our attention on what a perfectly efficient market would look like and how real markets differ from that ideal. As Thomas Coleman, a professor at Johns Hopkins University and the author of *A Practical Guide to Risk Management* (CFA Institute Research Foundation, 2011) and *Quantitative Risk Management* (Wiley, 2012), writes:

EMH is powerful not so much because it is right or wrong - but rather because it (1) reminds us that generating alpha is hard (markets are not grossly inefficient) and (2) pushes us to ask where, why, and by how much markets are inefficient.²

¹ Quoted at http://chemwiki.ucdavis.edu/Textbook_Maps/Map%3A_Petrucci_10e/01%3A_Matter-Its_Properties_And_Measurement/1.1%3A_The_Scientific_Method, accessed on July 14, 2014.

² Personal communication. This article was critically reviewed by Professor Coleman, a longtime friend and occasional collaborator.

If EMH is an imperfect yet valuable hypothesis, Modern Portfolio Theory or MPT rises to the level of an invaluable theory. I define MPT broadly as a collection of major propositions in finance starting with Markowitz optimization (1952) and ending with Black-Scholes-Merton option pricing (1973). Let's enumerate the elements of MPT broadly construed (in no particular order):

The seven great ideas of modern finance:

- Dividend or cash-flow discounting (asset price as a present value)
- Interest rate expectations hypothesis
- No-arbitrage condition
- Market efficiency
- Portfolio efficiency (mean-variance optimization and related concepts)
- CAPM (relation between correlated risk and expected return)
- Optionality and option pricing

Another strong candidate is:

- Arbitrage pricing theory (mapping security returns into multiple factors).

And if we want to be ecumenical and bring in corporate finance, let's also include:

- Capital structure indifference, and
- Dividend indifference.

This is a pretty powerful body of knowledge. (From this point forward, I'm going to use "MPT" as shorthand for the whole list.) It is integrated — the parts fit, with each proposition consistent with all the others. It is testable and falsifiable. But the evidence on major parts of it, particularly market efficiency and the CAPM, don't rise to the standard of "overwhelming evidence." There are major doubts. So what is it useful for?

MPT's propositions are *useful as a null hypothesis and point of departure*.

Take, for example, the CAPM. The CAPM says what the return on a security *should be*, given the market return, the riskless rate, and the beta or correlated risk of the security. We know that the actual return on the security will differ from the CAPM's prediction. We call the excess return "alpha," and we credit the manager who picked that security with skill if the alpha is positive at a statistically significant level.

We know, then, that the CAPM cannot be exactly right because, if it were, all alphas would be zero (on average over time). There would be no manager skill to measure. But we also need the CAPM to provide the benchmark for measuring the managers whose ability to generate alpha has invalidated the CAPM!

In other words, the *null hypothesis*, what we should believe for the time being until the data convince us otherwise, is that the market is efficient and the CAPM gives accurate forecasts. This is what a manager asserting skill seeks to disprove, and our bias should be to require quite a lot of evidence. The return forecast given by the CAPM is also the *point of departure* for an inquiry into whether a manager has earned an alpha that is (1) positive, (2) statistically different from zero, and (3) sustainable or repeatable. If a manager doesn't pass those tests, he or she can be judged as having delivered the return that the CAPM predicted, and that could therefore be earned by combining a market index fund and a long or short position in the riskless asset (without paying the manager for any value added).

Without the CAPM, we wouldn't be engaging in scientific performance measurement. We'd be saying, "This return seems pretty good. It's better than what Steve at the country club got." There would be no thought of levering the market return up or down to create a neutral, objective benchmark.

The other propositions in the list above are similar. They're not universal truths, but are neutral base cases or starting points for an investigation.

So, Eugene Fama is right that the EMH is a vitally important concept against which all claims of market inefficiency or alpha generation can and should be tested. Robert Shiller is right that the EMH fails the test much more often, and more convincingly, that can be accounted for by accident and random variation; the market really isn't perfectly efficient.³

HAVE WE BEEN USING TOO TOUGH A STANDARD FOR JUDGING MPT AS A THEORY?

So far, we've been evaluating MPT and its components as scientific theories, and they fall somewhat short. But economics is not a natural science. It's a social science. Some might say — and I'm inclined to agree — that it's a branch of animal behavior. What's a theory in the social sciences? Is MPT a theory in that context?

The sociologists Hans Joas and Wolfgang Knobl write,

Theories should be understood as generalizations. To put it the other way around, which may be easier to grasp, we might say: every generalization is already a theory. We use theories of this kind all the time, particularly in everyday life...The modern social sciences...now feature...a plethora of competing theoretical schools.⁴

³ See also a very valuable article by Cliff Asness and John Liew, "The Great Divide over Market Efficiency," *Institutional Investor*, March 3, 2014, <http://www.institutionalinvestor.com/Article/3315202/Asset-Management-Equities/The-Great-Divide-over-Market-Efficiency.html>

⁴ "What is Theory?" in "Social Theory: Twenty Introductory Lectures," Cambridge University Press, http://assets.cambridge.org/97805218/70634/excerpt/9780521870634_excerpt.pdf, pp. 2-4, accessed on July 14, 2014.

If, in the social sciences, a theory can be just a working hypothesis or set of conjectures, subject to empirical check and countered by opposing or contradictory theories, then MPT is much better than that. MPT is a network of interrelated propositions, developed to describe a specific aspect of the way the world works, that is supported by enough evidence that well-informed people take it seriously as the starting point for further investigation. It is not “exactly true” but there is no alternative set of propositions that is “more true” or even “just as true.”

CONCLUSION

And that is where MPT, the list of 10 great ideas shown above, stands. There are competing ideas but none of them hangs together as an integrated body of theory. Nor do the competing ideas have anything like enough evidence behind them to overturn or replace MPT. Behavioral finance is a start, but I regard it as an enhancement to MPT or, more finely understood, a set of exceptions to a general rule — a list of situations where MPT only gives you a pretty good answer instead of a great one.

Theoreticians should keep working on alternatives to MPT. But they should give proper respect to the body of knowledge they’re seeking to overturn. Meanwhile, practitioners should continue to pursue alpha. It’s out there. The market is not efficient. But it’s efficient enough that most investors will not beat the market with any consistency after proper adjustment for the risks taken and the explicit and hidden costs incurred. A few will.

Meanwhile, we’ll be building portfolios with an eye to risk, return, and correlation all considered simultaneously, as Harry Markowitz would have us do, albeit with some variations and enhancements. And, dear managers, if circumstances call for us to hire you to manage our assets, we’ll be mindful of the temptation to claim that you don’t pay attention to benchmarks and only buy the securities that go up. So we’ll be measuring you. And we’ll be using CAPM-based techniques, pioneered by William Sharpe, to do so.