



## Introduction

# What We Know—and What We Know We Don't Know

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We have learned much about finance in the 63 years since **Harry Markowitz** published the foundational paper of modern finance in a 1952 issue of the *Journal of Finance*. However, the more we learn, the more we realize what we don't really know. Think of this as our piece of the pie (what we know) is growing in size but the size of the pie is also growing. This issue of *Practical Applications* is particularly insightful in this regard. Important questions are raised: Is smart beta really smart? Is it possible to predict crashes? How do we define (and recognize) a bubble? Is a market capitalization-weighted benchmark still valid?

Let's start with a simple market-capitalization benchmark. This benchmark is available to anyone at extremely low cost thanks to **Jack Bogle** (See *Lighting Strikes: The Creation of Vanguard, the First Index Mutual Fund and the Revolution it Spawned*, pg. 22). How can we "beat" the benchmark? This is, of course, the Holy Grail. Here are a few insights that help us sort through.

What does it mean to "beat" the market? Over the longer term, a portfolio manager can have an average return that is higher than the market return for four reasons.

### JACK UP THE RISK

The portfolio manager might take more risk. If this risk is rewarded, then the average return should exceed the average market return. A good example of this is someone holding the S&P 500 and writing out-of-the-money calls and puts. The portfolio return exceeds the market return by the premiums collected for the options, given the options finish out of the money. However, if there is a spike in volatility, this portfolio has significantly more downside risk. Assuming these options are fairly priced, what appears to be "beating" the market is simply a reward for taking risk. The alpha (risk-adjusted return) is zero.

### MISVALUATION

The portfolio manager might be able to identify under- and over-valued assets. No one believes that prices at any point in time exactly reflect all information in the marketplace. While it is a fact that some markets are more efficient than others, all markets are inefficient. It is possible that a skilled manager can take advantage of mispricing. In my previous example, suppose the out-of-the-money calls and puts are hugely overpriced. After adjusting for the fact that the manager's portfolio has more risk than the S&P 500, there may be extra performance which we could legitimately label alpha.

The origins of mispricing range from a slow absorption of information to investors naively extrapolating future prices from past prices. Nevertheless, the identification of mispricing is a challenge because we never observe the true price. That is, a manager might think that an asset is undervalued according to their valuation model. However, the manager's valuation model could be wrong.

In addition, the degree of mispricing has likely decreased through time and will continue to decrease. This is a result of information being readily available in real time (don't need to wait for the newspaper to get the stock price), massive drop in the cost of transacting and

the rise of machines. Outperformance due to selectively buying undervalued asset and selling overvalued assets is alpha.

### TILTING

It is possible that a skilled manager can engage in market timing. A simple way of doing this is dynamically allocating to the S&P 500 or cash depending on the outlook for the market. A more complex way is to dynamically tilt towards certain factors such as illiquidity, volatility as well as the market. To revisit (and alter) my previous

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example, suppose we have a portfolio manager that holds the S&P 500 and *selectively* writes out-of-the-money calls and puts (which are fairly priced). The manager has some ability to time volatility. If the manager thinks that volatility will be tame, she actively writes calls and puts and collects the premium. If she thinks volatility may spike, she does not write any options. Of course, the option prices should reflect the market expectation of volatility. The expectation is the “average.” It is possible that some are more skilled than others in forecasting volatility. This skill manifests itself in alpha.

## FLUKE

Fourth, the manager can beat the market purely by luck and this is explored in my recent *Journal of Portfolio Management* paper with **Yan Liu** (*Evaluating Trading Strategies*, JPM 40<sup>th</sup> Anniversary Issue, Vol. 40, No. 5 ★). My paper gives a simple example of an investment manager sending out an email to prospective clients claiming to be able to beat the market. As an ‘out-of-sample’ test, the manager will send the prospective customer an email on the last day of the month saying whether the S&P 500 will go up or down in the next month. Amazingly, you receive 10 correct forecasts in a row. You allocate your money to the manager who has ‘beaten’ the market—but the manager disappoints after that. What is going on? The email was a scam. In the first wave, 100,000 emails were sent to prospective clients: 50,000 said the market was going up and 50,000 said the market was going down. In the next month, only 50,000 emails are sent—only to the people that received the correct forecast. The same scheme is followed: 25,000 emails say the market is going up and 25,000 the market is going down. This is repeated 10 times until 97 people have received 10 correct recommendations in a row ( $100,000 \times 0.5^{10} = 97$ ). There is no skill here. It is pure luck. However, it certainly looks like alpha.

If we count up all of the mutual funds, hedge funds, ETFs, investment advisors and advisory services, there are more than 100,000. Many will look good year after year but lack skill. Investors will be drawn to the winners and will be disappointed because there is no reason to believe that the run of good luck will continue.

## FINAL THOUGHTS

This last issue of separating luck from skill is perhaps the most vexing because it impacts everything. It really highlights what we know we don’t know. For example, an investor may decide to allocate to a manager who claims to beat the market by dynamically tilting towards certain risk factors. This should only work if: a) the manager has some skill in dynamically allocating across the many choices and b) these risk factors are true risk factors (meaning there is a premium earned from taking on the risk). But there has been a huge proliferation of factors. My paper with Liu and **Heqing Zhu** documents 316 risk factors (*... and the Cross-Section of Expected Returns*, working paper on SSRN, February 2015) that have been published in the academic literature. Many of these factors have permeated smart beta products discussed by **Burton Makiel** in this issue (*Is Smart Beta Really Smart?*, pg. 7). Some of these products “outperform” purely by luck.

Importantly, luck runs both ways and little attention is usually given to the other side. Specifically, a skilled manager may underperform the market for many years in a row—purely because of bad luck. The investor does not take luck into account and fires the manager. The investor then misses the opportunity to reap the rewards arising from the manager’s skills.

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