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Benchmarks as Limits to Arbitrage: Understanding the Low-Volatility Anomaly

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Abstract

Contrary to basic finance principles, high-beta and high-volatility stocks have long underperformed low-beta and low-volatility stocks. This anomaly may be partly explained by the fact that the typical institutional investor's mandate to beat a fixed benchmark discourages arbitrage activity in both high-alpha, low-beta stocks and low-alpha, high-beta stocks.

Although there are many candidates for the greatest anomaly in finance, a particularly compelling one is the long-term success of low-volatility and low-beta stock portfolios. Over 1968–2008, low-volatility and low-beta portfolios have offered an enviable combination of high average returns and small drawdowns. This runs counter to the fundamental principle that risk is compensated with higher expected return. We applied principles of behavioral finance to shed light on the drivers of this anomalous performance and to assess the likelihood that it will persist.

To recap the anomaly, whether risk is defined as volatility or beta and whether we consider all stocks or only large caps, low risk consistently outperformed high risk over this period. A dollar invested in the lowest-volatility portfolio in January 1968 would have increased to $59.55 by the end of 2008. Over this period, inflation eroded the real value of a dollar to about $0.17, meaning that the low-risk portfolio produced a $10.12 gain in real terms. In contrast, a dollar invested in the highest-volatility portfolio would have been worth 58 cents at the end of December 2008, assuming no transaction costs. Given the declining value of the dollar, the real value of the high-volatility portfolio declined to less than 10 cents—a 90 percent decline in real terms! The anomaly with respect to beta risk is similar. A dollar invested in the lowest-beta portfolio in January 1968 would have grown to $60.46 ($10.28 in real terms), and a dollar invested in the highest-beta portfolio would have grown to $3.77 (64 cents in real terms). Like the high-volatility investor, the high-beta investor also failed to recover his dollar in real terms and underperformed his “conservative” beta neighbor by 964 percent.

Behavioral models of security prices, such as ours, combine two ingredients. The first is that some market participants are irrational in some particular way. In the context of the low-risk anomaly, we believe that an important subset of investors have a preference for risky stocks. This preference derives from the biases that afflict the individual investor. We believe individuals’ preferences for lotteries and well-established biases of representativeness and overconfidence lead to demand for risk that is not warranted by fundamentals. This irrational demand causes such high-risk stocks to be overpriced, which, all else equal, leads to lower future returns.

The second ingredient is limits to arbitrage—an explanation for why the “smart money” does not step in and offset the price impact of any irrational demand. With respect to the low-risk anomaly, we believe that the underappreciated limit on arbitrage is benchmarking. Many institutional investors who are in a position to offset the irrational demand for risk have fixed-benchmark mandates, typically capitalization weighted, which, by their nature, discourage investments in low-beta and low-volatility stocks. We showed that traditional fixed-benchmark mandates (with a leverage constraint, an assumption that we discuss) cause institutional investors to pass up the superior risk–return trade-off of low-beta and low-volatility portfolios. Rather than being a stabilizing force on prices, the typical institutional contract for delegated portfolio management can induce the manager to hold higher-beta stocks, even those with negative alpha.

In this article, we review in more detail the long-term performance of low-risk portfolios, present our behavioral explanation and some associated evidence, and discuss the practical implications for investors and investment managers. Perhaps the most important practical implication is that unless individual investors' preference for volatile stocks and the use of benchmarks are somehow reversed, the low-risk anomaly is likely to persist.