

Ibbotson® SBBI®
2013 Valuation Yearbook

Market Results for
Stocks, Bonds, Bills, and Inflation
1926–2012



MORNINGSTAR®

Fama-French Three Factor Model

In 1992 Eugene Fama and Kenneth French published a landmark paper in the *Journal of Finance* titled "The Cross-Section of Expected Stock Returns." In this paper, Fama and French criticized the traditional capital asset pricing model (CAPM) for not adequately measuring asset returns. They found that the relationship between beta and average return disappears over the 1963–1990 period and is weak for the 1941–1990 period. This conclusion does not support the CAPM's key assumption: that returns on stocks are positively related to market betas.¹

After critiquing CAPM, Fama and French went on to identify two other characteristics that they claim better describe security returns than beta does—market value and the book-value-to-market-value ratio. While Fama and French at the time offered no explicit replacement for CAPM, their 1992 paper was the start of a series of critiques and arguments among academics that persists today.

The 1992 paper was followed that same year by an academic study conducted by Kothari, Shanken, and Sloan that seemed to contradict the findings of Fama and French. Kothari, Shanken, and Sloan concluded in their paper that returns do reflect significant compensation for beta risk, both statistically and economically, when beta is measured on an annual basis. (Fama and French used monthly data in their study.) However, they went on to say that the variation in expected returns may not be accounted for by beta alone.²

There were two more papers of importance published in 1993 in *The Journal of Portfolio Management*. "Are Reports of Beta's Death Premature?" was written by Chan and Lakonishok who detailed the influence of sample period selection on the conclusion of prior studies. They found a strong relationship between beta and return for the years of their study up to 1982. Though Chan and Lakonishok are not ardent supporters of beta, they "do not feel that the evidence for discarding beta is clear-cut and overwhelming."³

The second noteworthy article, written by Fischer Black, was titled "Beta and Return." In this article, Black refuted the conclusions of Fama and French and stated that "beta is alive and well."⁴ Black's main point was that Fama and French did not prove what they claimed to have proven—that beta has no explanatory power. Like Chan and Lakonishok, Black pointed to the selection of time period. Black also demonstrated that Fama and French's own results still showed a relationship, albeit weak, between beta and return for the selected period.

Finally, Fama and French revisited the issue in 1994.⁵ Building on their prior work, they proposed a three factor model for security expected returns:

1. Covariance with the market
2. Size
3. Financial risk as determined by the book-to-market ratio

As a result of this academic debate, Fama and French created a model that can be viewed as an extension of the CAPM. While the traditional CAPM only focuses on the covariance of security returns with the market as a whole, Fama and French add two additional elements: size and book-to-market value. They found that the returns on stocks are better explained as a function of size and book-to-market value in addition to the single market factor of the CAPM, with the company's size capturing the size effect and its book-to-market ratio capturing the financial distress of a firm.

Within the context of the Fama-French model, size is measured by market capitalization. Many studies, including one by Ibbotson Associates, have looked at firm size as a determinant of expected returns. The underlying notion is that small companies are viewed as riskier than large companies and therefore investors should be rewarded for taking on the additional risk. Firms with a higher book-to-market ratio (the more "financially distressed" companies) also demonstrate more risk than firms with a low book-to-market ratio. Again, investors should be rewarded with a higher cost of equity for taking on additional risk.