



INVESTING > FUNDAMENTAL ANALYSIS

Fama and French Three Factor Model

By [ADAM HAYES](#) | Updated Dec 13, 2019

What Is the Fama and French Three Factor Model?

The Fama and French Three-Factor Model (or the Fama French Model for short) is an asset pricing model developed in 1992 that expands on the capital asset pricing model (CAPM) by adding size risk and value risk factors to the market risk factor in CAPM. This model considers the fact that value and small-cap stocks outperform markets on a regular basis. By including these two additional factors, the model adjusts for this outperforming tendency, which is thought to make it a better tool for evaluating manager performance.

Investopedia uses cookies to provide you with a great user experience. By using Investopedia, you accept our [use of cookies](#).





KEY TAKEAWAYS

- The Fama French 3-factor model is an asset pricing model that expands on the capital asset pricing model by adding size risk and value risk factors to the market risk factors.
- The model was developed by Nobel laureates Eugene Fama and his colleague Kenneth French in the 1990s.
- The model is essentially the result of an econometric regression of historical stock prices.

The Formula for the Fama French Model Is:

Investopedia uses cookies to provide you with a great user experience. By using Investopedia, you accept our [use of cookies](#).





R_{it} = total return of a stock or portfolio i at time t

R_{ft} = risk free rate of return at time t

R_{Mt} = total market portfolio return at time t

$R_{it} - R_{ft}$ = expected excess return

$R_{Mt} - R_{ft}$ = excess return on the market portfolio (index)

SMB_t = size premium (small minus big)

HML_t = value premium (high minus low)

$\beta_{1,2,3}$ = factor coefficients



Investopedia uses cookies to provide you with a great user experience. By using Investopedia, you accept our [use of cookies](#).





1:31

Fama and French Three-Factor Model

How the Fama French Model Works

Nobel Laureate Eugene Fama and researcher Kenneth French, former professors at the University of Chicago Booth School of Business, attempted to better measure market returns and, through research, found that [value stocks](#) outperform growth stocks. Similarly, small-cap stocks tend to outperform [large-cap stocks](#). As an evaluation tool, the performance of portfolios with a large number of small-cap or value stocks would be lower than the [CAPM](#) result, as the Three-Factor Model adjusts downward for observed small-cap and value stock out-performance.

The Fama and French model has three factors: size of firms, book-to-market values and excess return on the market. In other words, the three factors used are [SMB](#) (small minus big), [HML](#) (high minus low) and the portfolio's return less the risk free rate of return. SMB accounts for publicly traded companies with small market caps that generate higher returns, while HML accounts for value stocks with high book-to-market ratios that generate higher returns in comparison to the market.

Investopedia uses cookies to provide you with a great user experience. By using Investopedia, you accept our [use of cookies](#).





There is a lot of debate about whether the outperformance tendency is due to market efficiency or market inefficiency. In support of market efficiency, the outperformance is generally explained by the excess risk that value and small-cap stocks face as a result of their higher [cost of capital](#) and greater business risk. In support of market inefficiency, the outperformance is explained by market participants incorrectly pricing the value of these companies, which provides the excess return in the long run as the value adjusts. Investors who subscribe to the body of evidence provided by the [Efficient Markets Hypothesis \(EMH\)](#) are more likely to agree with the efficiency side.

What the Fama French Model Means for Investors

Fama and French highlighted that investors must be able to ride out the extra short-term volatility and periodic underperformance that could occur in a short time. Investors with a long-term time horizon of 15 years or more will be rewarded for losses suffered in the short term. Using thousands of random stock portfolios, Fama and French conducted studies to test their model and found that when size and value factors are combined with the beta factor, they could then explain as much as 95% of the return in a diversified stock portfolio.

Given the ability to explain 95% of a portfolio's return versus the market as a whole, investors can construct a portfolio in which they receive an average expected return according to the relative risks they assume in their portfolios. The main factors driving expected returns are sensitivity to the market, sensitivity to size, and sensitivity to value stocks, as measured by the book-to-market ratio. Any additional average expected return may be attributed to unpriced or unsystematic risk.

Fama and French's Five Factor Model

Researchers have expanded the Three-Factor model in recent years to include other factors. These include "momentum," "quality," and "low volatility," among others. In 2014, Fama and French adapted their model to include five factors. Along with the original three factors, the new model adds the concept that companies reporting higher future earnings have higher

Investopedia uses cookies to provide you with a great user experience. By using Investopedia, you accept our [use of cookies](#).





Related Terms

Understanding High Minus Low (HML)

High Minus Low (HML), also referred to as the value premium, is one of three factors used in the Fama-French three-factor model. [more](#)

Small Minus Big (SMB)

Small Minus Big (SMB) is one of three factors in the Fama/French stock pricing model, used to explain portfolio returns. [more](#)

Small-Value Stock Definition

Small-value stock is stock in a company with a small market capitalization, but the term also refers to stock that is trading at or below its book value. [more](#)

Multi-Factor Model Definition

A multi-factor model uses many factors in its computations to explain market phenomena and/or equilibrium asset prices. [more](#)

Benchmark Definition

A benchmark is a standard against which the performance of a security, mutual fund or investment manager can be measured. [more](#)

Semi-Strong Form Efficiency Definition

Semi-strong form efficiency is a form of Efficient Market Hypothesis (EMH) assuming stock prices include all public information. [more](#)

Published on Dec 19, 2019

Investopedia uses cookies to provide you with a great user experience. By using Investopedia, you accept our [use of cookies](#).





Related Articles



TOOLS FOR FUNDAMENTAL ANALYSIS

Is Apple's Stock Over Valued Or Undervalued?



PORTFOLIO MANAGEMENT

Reduce Your Risk With ICAPM



ECONOMICS

Arbitrage Pricing Theory: It's Not Just Fancy Math



FINANCIAL ANALYSIS

Explaining The Capital Asset Pricing Model (CAPM)



RISK MANAGEMENT

Taking Shots at CAPM

Investopedia uses cookies to provide you with a great user experience. By using Investopedia, you accept our [use of cookies](#).





The Investopedia logo.

[Terms of Use](#)[Contact Us](#)[News](#)[Advertise](#)[Dictionary](#)[Careers](#)

The Dotdash logo, consisting of the word ".dash" in a bold, black, sans-serif font.

Investopedia is part of the Dotdash publishing family.

[The Balance](#) | [Lifewire](#) | [TripSavvy](#) | [The Spruce](#) and [more](#)

Investopedia uses cookies to provide you with a great user experience. By using Investopedia, you accept our [use of cookies](#).

