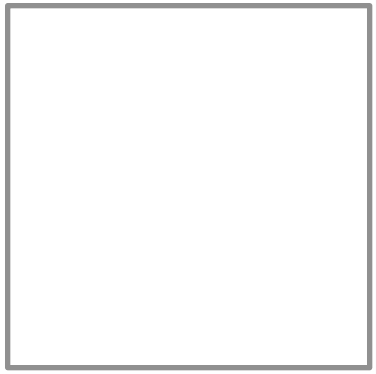
# Advancements in Research

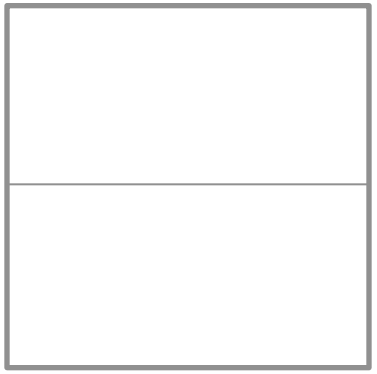
**Single-Factor Model (1963)**

**Market**



**Size Effect (1981)**

**Size**

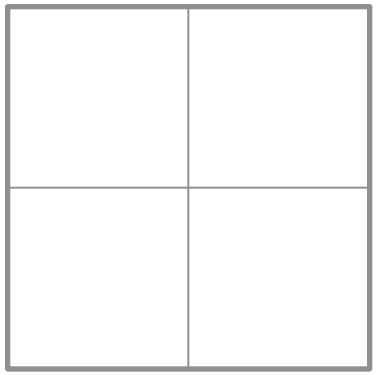


Large

Small

**Value Effect (1991)**

**Size**



Large

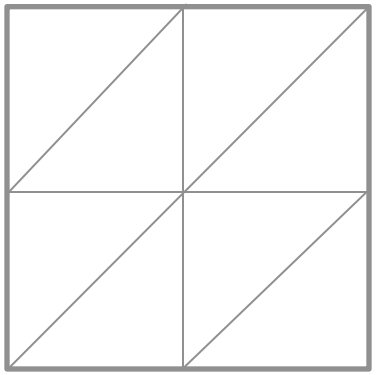
Small

Low High

**Relative Price**

**Expected Profitability (2012)**

**Size**



Large

Large

Small

Small

**Direct Profitability**

Low

High

Low

High

Low High

**Relative Price**

Over the past 50 years, academic research has identified variables that appear to explain differences in average returns among stocks. The variables (or premiums) that have stood up to rigorous testing are considered dimensions of expected returns.

**Single-factor model**—During the 1960s, William Sharpe and others conducted asset pricing research that led to development of the Capital Asset Pricing Model (CAPM), which proposed the market as a dimension of expected return. Known also as the single-factor model, CAPM reinforced the value of diversification and provided a simple, rational approach to measuring investment risk and expected returns relative to the market.

**Size effect**—Advancing research during the 1970s identified additional factors in stock performance. In 1981, Rolf Banz observed that small company stocks tended to have higher returns than large company stocks, as measured by their market capitalization. The size effect provided a more detailed framework for understanding the dimensions of equity performance.

**Value effect**—In a highly influential paper published in 1992, Eugene Fama and Kenneth French synthesized much of the previous research on asset pricing and found that stocks with low relative prices (or high book-to-market ratios) offered higher average returns than companies with high relative prices (low book-to-market ratios). They concluded that company size (small vs. large) and relative price (value vs. growth) were strong determinants of stock performance, and when combined with the market, explained most of the average differences among stock returns.

**Expected profitability**—More recently, Fama, French, and other academics have identified expected profitability as a dimension of expected returns. When controlling for size and relative price, research shows that more profitable firms have higher expected returns than less profitable firms. Direct profitability appears to offer a robust proxy for this dimension.[1]

Financial science has provided a refined, clarifying view of the global equity markets—and investors can apply this knowledge to target dimensions of higher expected return in their portfolios.

1. Direct profitability is a measure of a company's current profits. It is measured as operating income before depreciation and amortization minus interest expense, scaled by book equity.