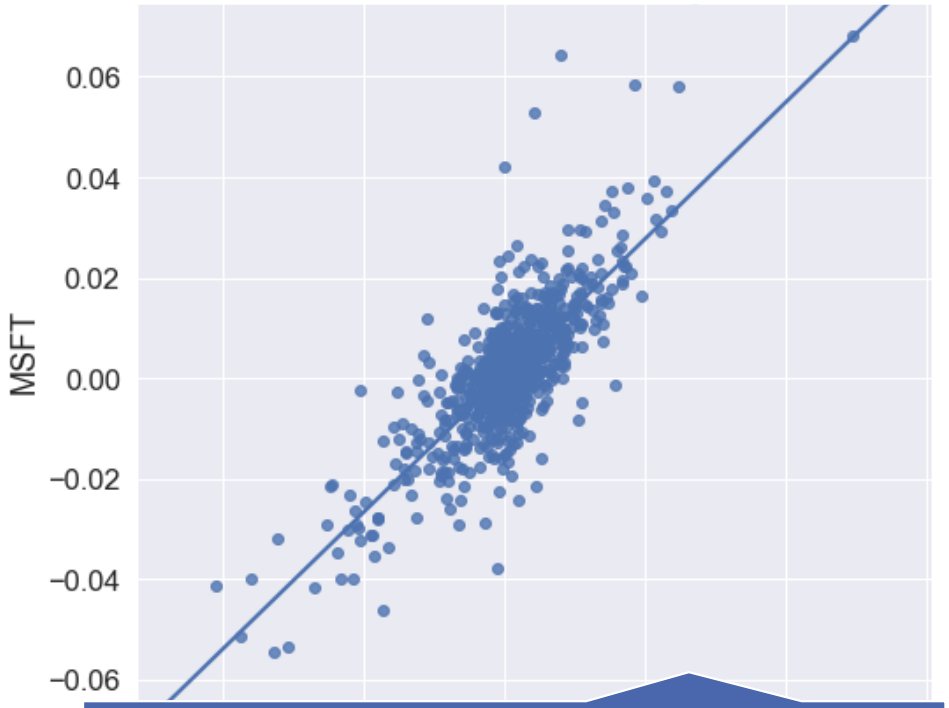
Fama-French Three-Factor Model



The Factors

Size and Value

CAPM extended by Size and Value

$$StockReturn = r_f + \beta^{Mkt} * MktPrem + \beta^{Size} * SMB + \beta^{Value} * HML$$

„Small minus Big“ „High minus Low“

Regression Model:

$$StockPremium_i = alpha + \beta^{Mkt} * MktPrem_i + \beta^{Size} * SMB_i + \beta^{Value} * HML_i + \varepsilon_i$$

Intercept

Slope Coefficients

Residuals

Dependent Variable

Independent Variables

The Factor Size (SMB)

- Empirical Evidence: Small Stocks outperform large Stocks (Market Cap)
- F&F Explanation: Small Stocks are riskier (more vulnerable to shocks)
- Consequence: Investors require Size Risk Premium for small Stocks
- Size Risk is a Systematic Risk Factor that is not reflected in Market Risk Factor

"Small minus Big" (SMB):

Returns of Portfolio(s) with Small Stocks – Returns of Portfolio(s) with Big Stocks

Interpretation of Slope Coefficient β^{Size}:

- $\beta^{Size} > 0$: Stock behaves like small Stocks (positive Size Risk Premium)
- $\beta^{Size} < 0$: Stock behaves like big/large Stocks (negative Size Risk Premium)

The Factor Value (HML)

- Empirical Evidence: Value Stocks with a high $\frac{\text{Book Value}}{\text{Market Value}}$ ratio outperform Growth Stocks with low $\frac{\text{Book Value}}{\text{Market Value}}$ ratio.
- F&F Explanation: Value Stocks have depressed Market Values as Investors do not expect future profits & growth → Financial Distress and Liquidation more likely
- Consequence: Investors require Risk Premium for Value Stocks
- Value Risk is a Systematic Risk Factor that is not reflected in Market Risk Factor

"High minus low" (HML):

Returns of Portfolio(s) with Value Stocks – Returns of Portfolio(s) with Growth Stocks

Interpretation of Slope Coefficient β^{Value}:

- $\beta^{Value} > 0$: Stock behaves like Value Stocks (positive Risk Premium)
- $\beta^{Value} < 0$: Stock behaves like Growth Stocks (negative Risk Premium)