Factor Investing

What is factor investing?

Factor investing is a common form of investing popularized by the classic analysis presented in the Fama French series of papers.

Factor investing assumes that risk factors alone drive asset prices and this is predicted by the efficient markets hypothesis.

What is a risk factor?

Risk factors represent risks in assets that are meaningful to investors and are not diversifiable. Not diversifiable means that one cannot simply hedge and trade away the risk by diversification. This is a systematic risk that's borne by the holders of an asset.

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Some of the example factors are the most famous market risk factor called beta. Other common risk factors are the growth factor and the size factor. The growth or sometimes called value factor is also called HML. High minus low.

High minus low captures the outperformance of growth stocks and it accounts for the difference in returns between value stocks with high book to market ratios and growth and stocks with low book to market ratios.

HML is calculated as a value portfolio with small value and big value minus at growth portfolio with small growth and big growth.

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The size factor called SMB. Accounts for the outperformance of small stocks. SMB is the average return of three small portfolios minus the average return of three big portfolios. The portfolios are the small value, small, neutral and small growth and the big value. Big, neutral and big growth portfolios.

Both the HML and SMB factors consider the effects of the other factor. This addresses concerns related to double counting of risk and missassociation of a source of risk.

Now identifying the true source source of risk is important in risk based pricing. These two new factors can be added to the cap and single factor model to form that Fama French three factor model.

The estimation is the same as for the CAPM. The first stage is a regression of asset returns on these three factors. The market, the growth and the size factor. The second stage takes the betas from the first stage for the market growth in size and multiplies this with the risk premiums associated with each one of these individual factors. This generates an estimate of the expected return of a stock based on his exposure to these three simple risk factors and the premium associated with those risk factors.

A number of additional candidate risk factors have been proposed in the literature, so much so that some describe it as a factor Zoo. For instance, the momentum factor, the profitability factor or liquidity factor have all been proposed and tested in a slew of academic papers.

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With so many factors, it's hard to know which work when and why factor that works means that it has actually correlated with some salient systematic risk in the economy. A number of false positives have been documented in the literature, and these are often called anomalies.

Anomalies are variables that seem to represent risk, but after careful scrutiny are simply spurious or temporary associations. Some reasons variables appear to be risk factors may be related to the inclusion of microcap stocks with large average returns but are not investable at scale data snooping, multiple testing and publication biases.

A lot of debate surrounds the number and exact methodology to identify risk factors. Some researchers suggest that a single market based risk factor should explain all returns. More. Pragmatic researchers suggest that. That more than one risk factor is required to explain and predict returns. Certainly the truth lies somewhere in between one and the thousands of factors that we currently have.

The final question is can machine learning help us to identify stable and priced risk factors? The answer to that is probably yes. For instance, A2 pass, least absolute shrinkage and selection operator called Lasso can be used to identify risk factors and eliminate spurious factors. Other machine learning algorithms can help with market timing and the identification of non factor but predictive variables. The future of asset pricing will certainly lean heavily on machine learning and data science in the future.

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