



Swedroe: Asset Type Matters With Factors

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There's a substantial body of research demonstrating that measures of company profitability and investment have explanatory power for the cross section of stock returns. High-profit firms tend to outperform low-profit firms, and high-investment firms tend to underperform low-investment firms.

For example, Kewei Hou, Chen Xue and Lu Zhang, authors of the 2015 paper "[Digesting Anomalies: An Investment Approach](#)," proposed replacing the Fama-French three-factor (market beta, size and value) model with a new four-factor model that went a long way toward accounting for many of the anomalies that neither the Fama-French three-factor model nor the Carhart four-factor model (which added momentum as the fourth factor) could explain.

Q-Factor Model

In their model, which Hou, Xue and Zhang call the q-factor model, an asset's expected return in excess of the riskless rate is described by the sensitivity of its return to the returns of four factors: market beta, size, investment (the difference between the return on a portfolio of low-investment stocks and the return on a portfolio of high-investment stocks) and profitability (the difference between the return on a portfolio of high return-on-equity stocks and the return on a portfolio of low return-on-equity stocks).

In an analysis of the q-factor model, Eugene Fama and Kenneth French (developers of the aforementioned three-factor model) agreed that a four-factor model that excludes the value factor (HML, or high minus low) captures average returns as well as any other four-factor model they considered, and that a five-factor model (including HML) doesn't improve the description of average returns over that of the four-factor models. This occurs because the average HML return is captured by HML's exposure to other factors. Thus, in the five-factor model, HML is redundant in explaining average returns.

However, Fama and French did note that "while the five-factor model doesn't improve the description of average returns of the four-factor model that drops HML, the five-factor model may be a better choice in applications. For example, though captured by exposures to other factors, there is a large value premium in average returns that is often targeted by money managers."

Thus, "in evaluating how investment performance relates to known premiums," investors "probably want to know the tilts of the portfolios toward each of the factors."

They add that, "for explaining average returns, nothing is lost in using a redundant factor." Fama and French further found that the five-factor model performs well. They write: "Unexplained average returns for individual portfolios are almost all close to zero."

Q Factors & Bonds

Benedikt Franke, Sebastian Muller and Sonja Muller contribute to the literature on the profitability and investment factors with their study "[The Q-Factors and Expected Bond Returns](#)," published in the October 2017 issue of the Journal of Banking & Finance. They used a sample of U.S. corporate bonds from 1995 to 2011 to examine how exposure to the q-factors is priced by corporate bond investors.

Corporate bonds are an important segment of financial markets with outstanding assets of more than \$8 trillion. In addition, the corporate bond market is dominated by institutional investors who are likely to be more sophisticated than individuals. And, most importantly, the bond market allowed the authors to offer new insight into the debate on whether factor premiums are risk-based or behavioral-based.

They used an ex-ante proxy for expected bond returns, adjusting a bond's yield to maturity for expected losses and tax differences before subtracting the equivalent-maturity Treasury yield to derive the implied risk premium. The following is a summary of their findings:

- There's a strong negative relationship between exposure to the profitability factor and the cost of debt—in other words, more profitable firms have lower debt costs. This finding was robust to different definitions of profitability (return on equity and gross profitability).
- The negative relationship between profitability factor exposure and expected returns is substantially more pronounced in economic downturns, in which investors should require higher compensation for holding risky assets. Results are similar in periods of low investor sentiment and high issuer quality, times when the research suggests that rational risk/return considerations are more likely to prevail.
- The q-factor profitability factor (which is based on return on equity) is better able to explain cross-sectional differences in expected bond returns than the Fama-French profitability factor (which is based on gross profitability).
- There is *not* a robust relationship between exposure to the investment factor and the cost of debt. This held true regardless of the state of the economy.
- There is a significant positive relationship between a bond's implied risk premium and its sensitivity to the market beta factor.
- Firm size, book-to-market ratio, quarterly return on equity and its asset growth are all statistically significant predictors of 12-months-ahead default, not controlling for ratings. In particular, large firms and high-profit firms have lower default risk, whereas high-book-to-market-ratio firms and high-asset-growth firms are more likely to default—a vote for the value premium as a risk factor.

Franke, Muller and Muller concluded their findings “are consistent with profitability being a risk factor, but suggest that high profitability implies lower (and not higher) risk.” They write: “Because the market portfolio consists of all risky assets including corporate bonds, our findings challenge a risk-based explanation for the profitability and investment patterns in stock returns.”

Finally, the authors add: “Evidence is consistent with two potential interpretations. First, one may argue that bond investors are correct about the relation between factor exposures and expected returns, i.e., higher profitability implies lower (and not higher) systematic risk, while investment is not associated with systematic risk. This would suggest that the high stock returns of high profit firms and low investment firms cannot be explained by an increased exposure to systematic risk, but may instead indicate mispricing in the equity domain.”

Mispricing In Bonds Vs. Stocks

This conclusion has important implications. While mispricings can persist in the face of limits to arbitrage, risk-based explanations should be preferred because they cannot be arbitrated away.

Equity investors should be aware there is new evidence that the profitability and investment equity factors are more likely a result of behavioral errors. This seems more likely than the other possible conclusion, which is that the institutional investors who dominate the corporate bond market are making persistent pricing mistakes that go uncorrected.

Assuming the former explanation, investors are better served by gaining exposure to the profitability and investment factors in equity markets, where they are (or, at least they have been) rewarded with a premium (higher returns), rather than paying a premium for safety (as has been the case in the bond market). This serves as another vote for taking corporate risk exposures in stocks, not bonds.

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