Fama-French Three-Factor Model Analysis of AVUV

This report analyzes the performance of the **Avantis U.S. Small Cap Value ETF (AVUV)** using the **Fama–French Three-Factor Model**, developed by **Eugene F. Fama** and **Kenneth R. French**. The model extends the **Capital Asset Pricing Model (CAPM)** by including two additional systematic risk factors—size (SMB) and value (HML)—to better explain variations in stock returns. The objective of this analysis is to determine which risk factors explain the returns of AVUV over the past five years.

Data and Methodology

Monthly adjusted closing prices for AVUV were obtained from **Yahoo Finance** for the period March 2020 to February 2025. Monthly ETF returns were calculated using percentage changes in adjusted closing prices and converted into decimal format.

Monthly factor data including market excess return (Mkt-RF), size factor (SMB), value factor (HML), and the risk-free rate (RF) were downloaded from the **Ken French Data Library**.

Model Summary

Metric	Value
Observations	60
R^2	0.9614
Adjusted R^2	0.9594

The high R^2 indicates that approximately **96% of the variation in AVUV's excess returns is explained by the three systematic risk factors**, demonstrating the strong explanatory power of the Fama-French model.

Coefficient Estimates

Variable	Coefficient	P-value	Significance
Alpha (α)	0.00168	0.4246	Not Significant
Market (Mkt-RF)	1.1217	≈0	Significant
Size (SMB)	0.7844	≈0	Significant
Value (HML)	0.7306	≈0	Significant

Interpretation of Results

The regression results provide insight into the economic drivers of AVUV's returns.

Alpha (α) is positive but statistically insignificant. This suggests that the ETF does not generate abnormal returns beyond what is explained by the three systematic factors.

Market Beta (β = 1.12) is highly significant and slightly greater than one. This indicates that AVUV is somewhat more volatile than the overall market. A 1% increase in the market excess return is associated with approximately a 1.12% increase in AVUV's excess return.

Size Factor (SMB) has a large positive and statistically significant coefficient (0.784). This confirms that AVUV has a strong tilt toward small-cap stocks, which is consistent with the ETF's investment mandate.

Value Factor (HML) is also positive and highly significant (0.731), indicating strong exposure to value stocks with high book-to-market ratios.

Conclusion

Overall, the **Fama-French Three-Factor Model provides an excellent explanation of AVUV's returns**, with the three factors explaining nearly all of the ETF's performance variation. The results indicate that AVUV's returns are primarily driven by exposure to the market, small-cap stocks, and value stocks.

The insignificant alpha suggests that AVUV does not generate abnormal performance beyond its factor exposures. Instead, the ETF's returns are largely explained by systematic risk premia captured by the size and value factors. These findings are consistent with AVUV's strategy as a small-cap value ETF.