Portfolio Returns Assignment: R&D Capital Replication

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**Objective:**

The objective of this assignment was to replicate the portfolio returns analysis with respect to R&D Capital Expenditure, as shown in class.

**Data Sources:**

* ***Daily*** Stock level information(CRSP Daily Stock - Securities table *[crsp.dsf]*; WRDS)
* ***Daily*** Fama-French 3 factor data (Kenneth French Library)
* ***Daily*** Distributions data (CRSP Stock Events – Distribution data *[crsp.desdist]*; WRDS)

**Pre-Processing:**

* Null Handling, including discarding non-numeric returns.
* Filtered out NULL/ “A” Share-Class. Currency limited to US Dollars.
* Filtered out only events where ‘facshr’ factor was greater than or equal to 1
* Working on Share Code 10/11 only. Discarding Financial Companies (SIC Codes not in 6000 – 6999)

**Methodology:**

The following methodology was adopted

1. Creating Sorted Portfolios
   1. Equal-weighted sorted portfolio
      1. Filtered out stocks that split in the last 6 months, calculated on a daily basis
      2. Average returns of above stocks calculated.
   2. Value-weighted sorted portfolio
      1. Stocks split similar to equally weighted portfolio
      2. Weighted average of returns by market cap of each bracket calculated on a daily basis
   3. Equal-weighted sorted portfolio, without top 500 companies
      1. Filtered stocks that split in the last 6 months, discarded top 500 companies, on a daily basis
      2. Average returns of above stocks calculated.

Average Returns for each portfolio was calculated and the returns were regressed against the Market Risk Premium (for CAPM) and; Market Risk Premium, SMB and HML (for Fama-French 3 factor model)

The alphas for the models, the t-stat of the alphas, sharpe ratios corresponding to the portfolios were also recorded.

**Insights and Recommendations:**

**Portfolio Performance Metrics:**

**Table

Description automatically generated**

The analysis and the corresponding plots indicate that stock splits does indeed increase the average returns (above the market returns). But this excess return is almost negligible.

Value weighted Portfolios created after excluding the large cap companies seem to have even lower alphas, indicating that this strategy does not work that well for mid cap and small cap firms.. These alphas are statistically significant (p is <0.000).

Thus, it is recommended that we invest in a value weighted portfolio of the stocks that split in the last 6 months.