Empirical Methods for Finance

Second Graded Assignment
Event Study around Stock Split Announcements

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Due: December 5, 2021 (midnight)

In theory, the number of outstanding shares should have no effect on the company's value. Still, you read in a financial newspaper that markets tend to respond positively to companies' stock split announcements. The standard explanation for the positive reaction is that the market learns about companies' fundamentals from the decision."Splits are a good sign as companies don't split unless they are feeling good about themselves", says a financial analyst interviewed by the newspaper.

In this assignment, you want to measure the response of stock returns to stock splits in the data and see if you can replicate the above result yourself.

For this purpose, you are given a dataset (*eventstudy.dta*) on companies' stock returns in 2005 and 2006, which also contains information on whether companies performed a stock split in 2006. All the variables in the dataset are described at the end of the document.

Questions

1. Generate a dummy variable *split* that is equal to one for companies that do a stock split and those that don't. How many companies in the sample announce a split in 2006 and how many do not? [2 pt]
2. Compute companies' market capitalization (*marketcap*). [1 pt]
3. Compute separately for companies that do split and those that don't the average market capitalization, beta, stock return in 2005 ($BHR05$) and stock return in 2006 ($BHR06$). [2 pt]

4. Focus on the difference in average annual return in 2006. Is this difference statistically significant? Is the evidence consistent with the idea that market respond positively to stock split announcements? [3 pt]

5. What problems do you see with this analysis as an attempt to identify empirically the causal effect of stock splits on stock returns? *Hint: is the group of companies that do not split a good counterfactual for the return of splitting companies had they not announced a stock split?* [3 pt]

6. Let's focus on the sample of splitting companies only. Drop companies that do not announce any stock split in 2006. [1 pt]

7. Generate a dummy variable *eventwindow* for the 21 days around the split announcement (-10,+10). Generate a dummy variable *estimationwindow* that indicates a 30 days period starting 20 days before the announcement (-50,-20). [2 pt]

8. For each stock compute the average return (*avgret*) during the estimation window. [2 pt]

9. Compute abnormal returns according to three different definitions [3 pt]:

   (a) $aret1 = ret - \overline{ret}$,
   where $\overline{ret}$ is the average return in the estimation window that you just computed

   (b) $aret2 = ret - vwret$,
   where $vwret$ is the contemporaneous market return

   (c) $aret3 = ret - \beta_m vwret$,
   where β_m is the market beta estimated during the estimation window (already given to you).

10. For each of the three definitions of abnormal returns, compute the cumulative abnormal returns (*cumaret*). [2 pt]

11. For each of the three definitions of abnormal returns, test if the average 10-days *cumaret* is statistically different from zero. Comment on the results. [3 pt]

12. Produce a plot of the average *cumaret* computed using the market model over the 21-days event window. *(Hint: collapse your data by event time before doing the plot.)* [3 pt]

13. Suppose that you could randomly pick a number of companies and force them to do a stock split. How do you think stock returns of these companies would respond? Consider two scenarios: one in which investors know that companies where chosen randomly by you and one in which the market is not aware of the experiment. [3 pt]

Datasets and Variables Description

The dataset *eventstudy.dta* contains the following variables:

- *permno*: CRSP unique stock level identifier
- *date*: date
- *prc*: stock price
- *ret*: daily stock return
- *shrout*: number of shares outstanding
- *vwret*: market return
- $BHR06$: annual stock return in 2006
- $BHR05$: annual stock return in 2005
- *et*: event time, i.e. the number of days from the day when a stock split is announced. $et = 0$ corresponds to the day of the announcement. Negative numbers indicate the days prior to the announcement, while positive numbers are assigned to the days after the announcement.
- *beta*: market beta for the stock estimated on a estimation window preceding the event (only available for splitting stocks)