Dividend Event Study

Yanxiang Zhao

January 25, 2019

Executive Summary

When a company pays dividend, the market adjusts its stock price downward on the ex-dividend date. In order to study the effect of the dividend events, I analyzed the daily excess rates of return at around the ex-dividend dates (from 20 days before the ex-divdend date to 20 days after) of the 556 constituent stocks of S&P500 from 01/01/2010 to 06/29/2018. In 11,918 dividend events, the average daily rate of return on the ex-dividend date is -48.29 bps, which is significantly lower than the daily average of the 41-day period at -0.1859 bps.

Data Analysis

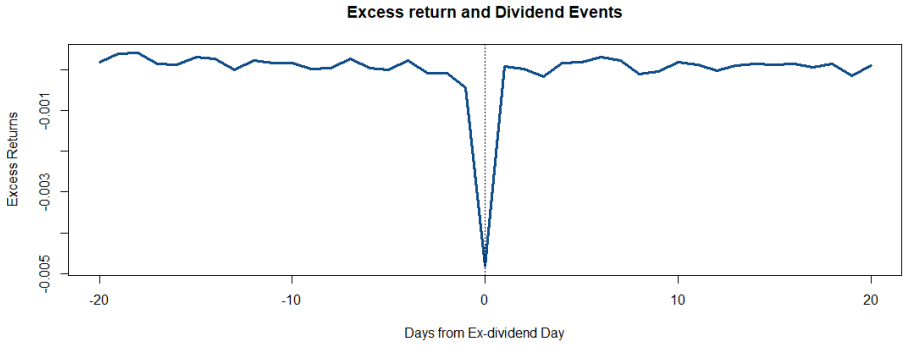
The data I used was downloaded from CRSP. I used the stock returns without distributions - RETX, to analyze the effect of a dividend event on the price level returns of a stock. To obtain the more representative result, I used the S&P500 constituent stocks from 01/01/2010 to 06/28/2018 to test the dividend effect. In order to understand the effect of a dividend, I compared the the stock's return on the ex-dividend date with the returns in 20-day periods before and after the ex-dividend date on each day to see the pattern. I took the daily average on each day from the 20th day before the ex-dividend date to the 20th day after the ex-dividend date for each dividend event across all S&P500 stocks. Lastly, I plotted the daily average returns on a time-series plot to show the return pattern during a dividend event.

During the 8 years and a half period, there were 556 stocks that have been included in the index. The 556 stocks have made a total of 12,161 dividends. Out of the 12,161 dividend events, 11,918 of them (98%) had sufficient data of 41-day returns for me to perform the analysis.

Conclusion

The S&P500 stocks showed a genuine increase in returns leading to the ex-dividend date with a daily average return of 1.21 bps. The stocks also showed a decrease in returns after a dividend event with a daily average return of -1.64 bps. On the ex-dividend date, out of 11,918 observations, 7,723 (65%) of them had negative returns. The average rate of return on the ex-dividend date is -48.29 bps, which is anomalously lower than the average rate of return around the ex-dividend date.

Figure



Python Code

```
import pandas as pd

# import data
univ = pd.read_csv("inputs/univ.csv")
const = pd.read_csv("inputs/const.csv")
# rewrite NaNs in SP500 constitudents
const.loc[const["thru"].isnull(), ["thru"]] = 20190101
# merge the data
const = const.rename(columns = {"co_tic":"TICKER"})
univ_500 = pd.merge(univ, const, on = "TICKER")
# select dates
univ_500 = univ_500.loc[(univ_500["date"] >= univ_500["from"]) & ...
           (univ_500["date"] <= univ_500["thru"])]

# clean RETX
univ_500["RETX"] = univ_500["RETX"].convert_objects(convert_numeric=True)
univ_500 = univ_500.dropna(subset = ["RETX"])
# calculate excess return
univ_500["xRetx"] = univ_500["RETX"] - univ_500["sprtrn"]


# write 41 days of returns on one row
xRetxDt = univ_500.sort_values(["TICKER", "date"], ascending = [1,1])
for i in range(20):
    xRetxDt["lag"+str(i+1)] = xRetxDt["xRetx"].groupby([xRetxDt["TICKER"]]).shift(i+1)
    xRetxDt["lead"+str(i+1)] = xRetxDt["xRetx"].groupby([xRetxDt["TICKER"]]).shift(-(i+1))
# select data on ex-dividend date
xRetxDt_exd = xRetxDt.loc[pd.notna(xRetxDt["DIVAMT"]) & pd.notna(xRetxDt["lag20"]) & ...
              pd.notna(xRetxDt["lead20"])]
xRetxDt_exd = xRetxDt_exd.loc[:,["lag"+str(i) for i in range(20,0,-1)] ...
              + ["xRetx"] + ["lead"+str(i+1) for i in range(20)]]
# compute mean return each day
xRetx_avg = xRetxDt_exd.mean(axis=0)

# plot
xRetx_avg.index = list(range(-20,0)) + [0] + list(range(1, 21))
xRetx_avg.plot()
```