

Brandt Green

12/2/21

Stock Splits

Objective:

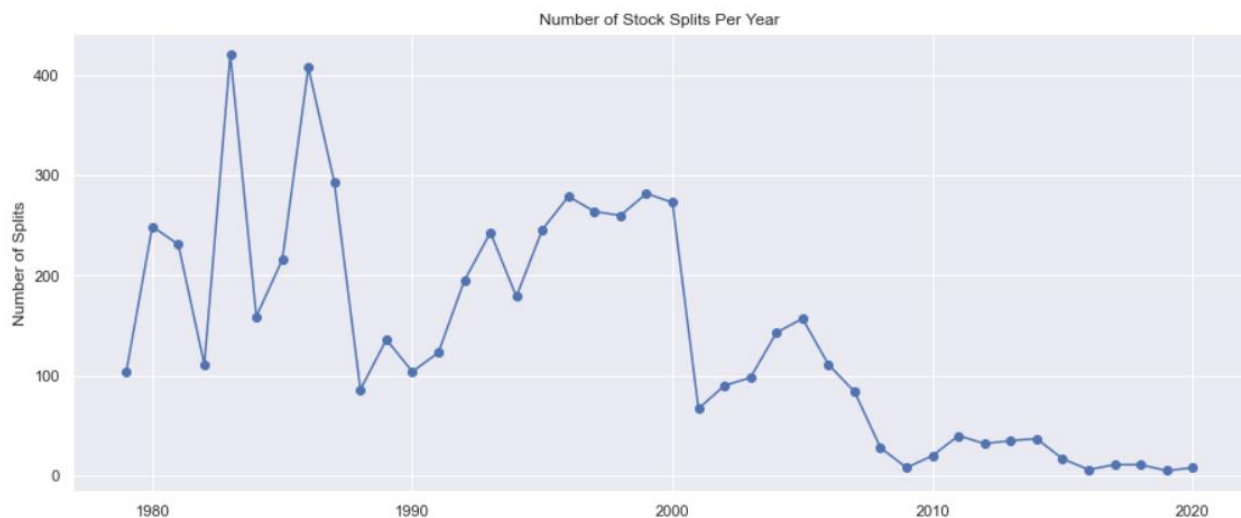
Two primary goals: understanding the market's reaction to stock split announcements and examining the performance of portfolios constructed from stocks that have recently split.

Assumptions/Notes:

- No trading cost.
- Reverse splits are excluded, and only share splits with a 2 for 1 factor or more are included.

Analysis:

First, after conducting brief exploratory analysis, we observe that the number of stock splits that occur each year has drastically decreased over the past few decades. Of course, one contributing factor to this decrease is surely because of the smaller number of public companies, but the decrease still appears extreme, even after accounting for reduced company counts.



Announcement Returns:

To uncover how the market reacts to stock split announcements, we examined all stock splits that were announced between 1980-2020. For each announcement we calculate the two-day

cumulative return of the stock based on the announcement day and the following trading day. Additionally, the excess return over the market for the same two-day window was calculated. The returns for all of the splits were averaged and the results are reported below.

Calculation	Average
Two Day Return	3.24%
Two Day <i>Excess</i> Return	3.14%

Stock Split Portfolios:

Next, a back test was done to simulate the performance of portfolios constructed of only securities that have had a stock split in the past 6 months. There were 4 portfolios examined:

- Value Weighted All
- Equal Weighted All
- Value Weighted No 500
- Equal Weighted No 500

All portfolios were reconstituted and rebalanced monthly. Meaning that at the start of each month, the portfolios kicked out securities that had not had a split in the past 6-months and added securities where there was a split in the last month. Additionally, the portfolios were re-balanced to either equal or value weights depending on the portfolio. The only other difference between the portfolios, is that the portfolios labeled with the suffix 'No 500' also excluded the biggest 500 companies by market cap from the portfolio.

The results from regressing the excess monthly returns of each portfolio on CAPM independent variables and Fama French independent variables are displayed below.

	CAPM_Betas	CAPM_Alpha	CAPM_t_stats	FamaFrench_Betas	FamaFrench_Alpha	FamaFrench_t_stats	Sharpe_Ratio
value_weighted_all	[0.0, 1.09]	0.00343	[1.77, 25.51]	[0.0, 1.0, 0.09, -0.46]	0.00464	[2.52, 23.91, 1.45, -7.35]	0.17235
equal_weighted_all	[0.01, 1.19]	0.00544	[2.77, 27.6]	[0.01, 1.05, 0.62, -0.24]	0.00614	[3.54, 26.6, 10.37, -4.12]	0.20256
value_weighted_no_500	[0.0, 1.01]	0.00434	[2.17, 23.11]	[0.01, 0.92, 0.05, -0.61]	0.00593	[3.25, 21.99, 0.72, -9.88]	0.18283
equal_weighted_no_500	[0.01, 1.12]	0.00638	[3.04, 24.27]	[0.01, 0.95, 0.52, -0.55]	0.00786	[4.37, 23.25, 8.44, -9.0]	0.21026

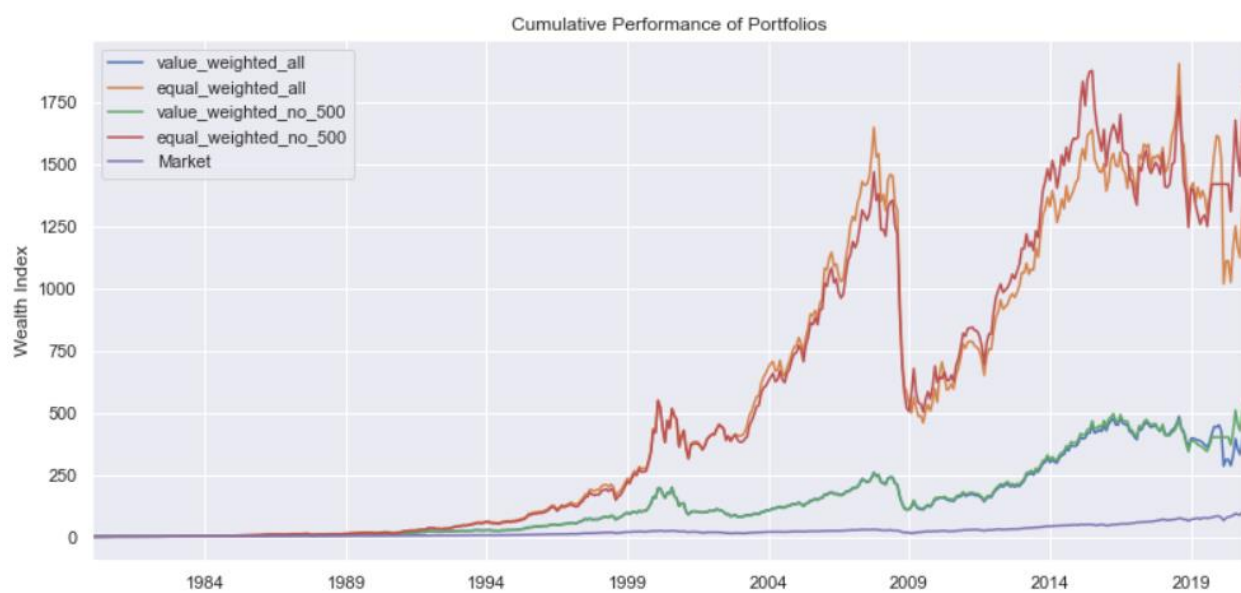
Note: Results are all obtained using monthly values and reported in decimals, not %.

Performance Examination:

Finally, we also calculated basic summary stats for all portfolios and the market as a quick comparison:

	mean	std
value_weighted_all	0.17467	0.22478
equal_weighted_all	0.20755	0.23845
value_weighted_no_500	0.17930	0.21918
equal_weighted_no_500	0.21268	0.23672
Market	0.12618	0.15586

Notes: Returns and standard deviations have been annualized from monthly calculations.



We can clearly see that the higher expected annual return of the portfolios dominates the market over such a long time horizon.