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Excess Returns, Stock Splits, and Analyst Earnings Forecasts

FQ Perspective

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Introduction

It is well documented that positive earnings surprises (the difference between actual earnings and the analyst consensus forecast) are associated with positive excess returns.[1] Companies with high earnings forecast accuracy also tend to outperform firms with low earnings forecast accuracy.[2] From an investor's point of view, an interesting question is then can we predict which companies will have positive earnings surprises or have accurate earnings forecasts, and can we use the prediction to generate excess returns? A number of recent studies have begun to explore this question, with promising results.[3]

This paper investigates the possibility that earnings surprises and earnings forecast accuracy can be predicted with stock split information. Stock splits are expected to be good predictors because of "attention" effects. The attention hypothesis, first proposed by Grinblatt, Masulis, and Titman (1984), is a special version of the signaling theory. The hypothesis presume that managers know more about the value of their firm than investors, and use splits to convey their favorable information to the market. The attention hypothesis asserts that when a firm splits its stock, more analysts begin to follow it. As a result, the value of the company is reassessed and its stock price becomes more informative. Underpriced firms find such reassessments desirable; overpriced firms do not. The implications are that earnings forecasts turn out to have been overly pessimistic for splitting firms, and that after a split, earnings forecasts are more accurate.

I report two pieces of evidence consistent with an attention effect following stock splits. First, the accuracy of analyst earnings forecasts is shown to increase after a stock split. Second, splitting firms are shown to be more likely to have positive earnings surprises than non-splitting firms. Stock split information, then, can predict forecast accuracy and earnings surprises.

These results suggest that incorporating split information can enhance the performance of trading rules based on analyst earnings forecasts. To investigate this, I formulate two trading rules and simulate them from January 1979 to December 1996. The first rule—which essentially says to buy stocks that split recently each month—outperforms the S&P 500 by 5.29% on average each year, consistent with the findings in Ikenberry et al. (1996). The second rule—based on the trend of earnings forecast revision and stock splits—does even better. It outperforms the S&P 500 by 11.54% per year on average. Moreover, this strategy generates positive returns in every year, which includes both up and down markets.

Data

The attention effect of stock split is examined using data drawn from two sources: the I/B/E/S history tape and the BARRA database. The I/B/E/S tape provided the earnings forecast errors, and the month of each stock split. The BARRA database provided data on month-end prices, market capitalization, book to price ratios, and monthly returns. The resulting sample consists of 1,478 2-for-1 splits and 800 3-for-2 splits conducted by 1,668 companies during the 19 year period from 1978 to 1996. A matching sample was also selected to control for possible firm size, industry, and time-series effects.[4]

Descriptive statistics appear in Exhibit 1. The number of splits varies significantly from year to year. There are no obvious time trends in the number of analysts or the pre-split stock price. As expected, firm sizes trend upward.

I define the earnings forecast error (EFE) as the percentage difference between realized annual earnings and the consensus analysts' earnings forecasts:

EFE = (actual EPS - consensus EPS) / |consensus EPS|.

A positive EFE is therefore an indication of a positive earnings surprise. The absolute value of the EFE measures the accuracy the consensus analysts forecast.

[1] See Ball and Brown (1968) and Latane and Jones (1977), for example.

[2] See Huberts and Fuller (1995) and Ackert and Athanassakos (1997), for example.

[3] Peters (1993, 1993a) showed that earnings surprises are serially correlated and therefore predictable. Huberts and Fuller (1995) showed a similar pattern for earnings forecasts accuracy.

Exhibit 1.

Descriptive Statistics

		Splitting Firms			Non-Splitting Firms		
Year	Number of splits	Mean number of analysts	Median pre-split price	Median pre-split firm size	Mean number of analysts	Median pre-split price	Median pre-split firm size
1978	54	7.5	35.7	248.1	6.7	23.4	255.3
1979	57	9.0	38.0	361.2	8.3	26.1	319.4
1980	100	8.4	35.5	284.8	6.6	27.8	310.8
1981	108	8.2	32.5	368.4	8.5	27.7	352.0
1982	37	9.6	25.3	322.3	9.7	24.4	370.4
1983	142	9.0	41.8	365.1	10.0	28.7	365.3
1984	91	9.2	33.5	279.9	9.9	20.9	293.1
1985	138	8.8	34.7	338.2	8.7	25.1	339.8
1986	221	10.8	40.0	514.1	10.3	27.5	542.7
1987	185	12.0	36.6	561.7	11.3	26.2	568.8
1988	65	8.4	34.4	402.4	8.9	20.4	398.8
1989	110	12.9	34.1	521.9	11.3	24.6	547.3
1990	90	14.1	35.7	603.0	13.1	23.6	616.5
1991	117	10.0	36.7	523.5	11.1	24.5	518.8
1992	200	9.8	33.8	697.1	10.7	23.6	702.4
1993	174	10.2	33.0	539.4	10.0	24.0	559.0
1994	133	10.0	31.1	579.1	9.5	23.5	602.1
1995	190	9.7	34.9	826.7	9.6	27.4	845.6
1996	67	7.7	32.7	549.2	8.4	26.5	587.4
Total	2,278	9.99	34.99	473.90	9.87	25.15	491.51

Evidence on the Attention Effect of Stock Splits

The attention hypothesis maintains that managers announce a stock split to attract attention from financial analysts, which leads to a reassessment of the firm's future cash flow. With more analysts paying attention, investors have more accurate information about the firm. Since one measure of better information is the accuracy of analyst earnings forecasts, an implication from the attention hypothesis is that analyst earnings forecasts are more accurate after a stock split. The evidence of this implication is presented in Exhibit 2.

The entries in Exhibit 2 include the median absolute EFE one year before, and one, two and three years after a split announcement, and the median percentage change from one year before a split to one to three years after a split. The last column presents the difference in absolute EFE between split firms and the matching firms.

Exhibit 2 shows that the absolute EFE during the first two years after a split announcement is significantly lower than the absolute EFE one year before a split. This pattern is observed for both 2-for-1 splits and 3-for-2 splits. Non-splitting firms do not show such a pattern, which indicates that the increase in earnings forecast

Exhibit 2.

Earnings Forecast Accuracy Before And After A Split

(Split month=0)	Splitting Firms Median |EFE|	Splitting Firms Median percentage change of |EFE| from year-1	Non-Splitting Firms Median |EFE|	Non-Splitting Firms Median percentage change of |EFE| from year-1	Difference between splitting and non-splitting firms
2-for-1 Splits					
year-1	3.57		4.97		-1.40 [a]
year+1	2.56	-24.89[a]	5.08	-3.41	-2.52 [a]
year+2	2.75	-16.62[a]	5.41	5.35	-2.66 [a]
year+3	3.36	4.27	4.98	1.98	-1.62 [a]
3-for-2 Splits					
year-1	4.17		6.12		-1.95 [a]
year+1	2.99	-23.25[a]	5.26	8.18	-2.27 [a]
year+2	3.34	-20.00[a]	6.82	9.33	-3.48 [a]
year+3	3.57	-7.92	6.06	-22.39	-2.49 [a]

[a]Signed rank statistic significantly different from zero at the 0.01 level.

accuracy is not a time trend. And lastly, the absolute EFE of splitting firms is significantly lower than that of matching firms, suggesting that analysts earnings forecast are more informative generally for splitting firms than non-splitting firms.

The attention hypothesis also asserts that firms which announce a stock split are undervalued. One measure of undervaluation is underestimation of a firm's future earnings, that is, a positive EFE. The following behavior would be consistent with that hypothesis: A splitting firm's EFE positive before a split, and afterwards moving toward the average level of non-splitting firms. Evidence on this implication is reported in Exhibit 3.

The entries in Exhibit 3 include the median EFEs both one year and two months before a split, and one, two and three years after a split. The ratio between the number of positive EFE and the number of negative EFE is also reported. A value greater than one means that there are more positive EFEs than negative EFEs. The last column presents the difference in EFE between split and non-split firms.

The results in Exhibit 3 show that for both 2-for-1 and 3-for-2 splitting firms, analysts underestimated their earnings one-year before and one-year after a split announcement. Although analyst earnings forecasts during the second post-split year are correct on average, these forecasts are significantly less upward-biased than the forecasts for firms in the matching sample. In contrast, analysts tend to be overoptimistic about the earnings prospects for firms in the matching sample. The overoptimism is especially apparent for smaller companies (that is, the matching firms for 3-for-2 splits). Interestingly, the analysts seem to go back to their old overoptimistic pattern from the third post-split year onward.

The pessimistic biases in the earnings forecasts of splitting firms indicates that splitting firms are more likely to have positive earnings surprises than non-splitting firms during the two post-split years. This may partially explain why the splitting firms' prices rise before the split announcement, and why splitting firms tend to outperform the market during their three post-split years (Ikenberry et al., 1996).

Exhibit 3.

Earnings Forecast Errors Before And After A Split

	Splitting Firms		Non-Splitting Firms		Difference between
(Split month=0)	Median EFE	Positive/ Negative	Median EFE	Positive/ Negative	median EFE, splitting and non-splitting firms
2-for-1 Splits					
year-1	0.00	1.38	-0.44	0.82	0.44[a]
month-2	1.20	2.16	0.00	0.99	1.20[a]
year+1	0.42	1.41	0.00	0.99	0.42[a]
year+2	0.00	1.05	-0.10	0.86	0.10
year+3	0.00	0.83	-0.51	0.79	0.51[b]
3-for-2 Splits					
year-1	0.00	1.28	0.00	0.75	+0.00 [a]
month-2	0.98	1.73	-0.80	0.79	1.78 [a]
year+1	0.78	1.17	-0.84	0.77	1.62 [a]
year+2	0.00	0.95	-0.57	0.80	0.57
year+3	0.00	0.84	0.00	0.91	0.00

[a]Signed rank statistic significantly different from zero at the 0.01 level.
[b]Signed rank statistic significantly different from zero at the 0.01 level.

Performance of Trading Rules That Incorporate Split Information

Of course, an important question is whether we can use this information to generate excess returns. I investigate two possibilities: The first question is whether abnormal returns can be obtained based on split signals alone. I examine this using the following trading rule:

Trading rule 1: Each month buy an equal amount of stocks which announced a 2-for-1 or 3-for-2 split during previous two years, and sell stocks in the portfolio which do not fit this requirement.

Second, because the consensus analyst earnings forecast for split firms is less likely to be overoptimistic than the one for non-split firms, an upward revision of earnings forecasts for a split firm may be a stronger positive signal than a similar revision for a non-split firm. The next question is then whether splitting firms with an upward revision of earning forecasts will outperform non-splitting firms with a similar revision. This is examined with a second trading rule:

Trading rule 2: Each month buy an equal amount of stocks satisfying the following two criteria: 1) the underlying firms announced a 2-for-1 or 3-for-2 split during the previous two years, and 2) the most recent revision (in the last three months) is positive; and sell stocks which do not satisfy these criteria.

I simulate these two trading rules beginning in January and liquidate the portfolio at the end of each year from 1979 to 1996. The 12-month cumulative excess returns based on the two trading rules are reported in Panels A and B of Exhibit 4, respectively.

First consider trading rule 1. It can be seen that the split-based trading rule outperformed the S&P 500 by a significant 5.29% per year on average, consistent with the findings in Ikenberry et al. (1996). The yearly performance is rather consistent: it slightly under-performed the market during only three out of eighteen years in the sample.

The performance of trading rule 2, which incorporates both splits and earnings forecasts, is even better. It produced an annual excess return of 11.54 percent per year on average. What's more, the year-by-year performance is uniformly positive in both bull and bear markets.

The last question we investigated concerns the possibility that earnings forecast signals are more informative for splitting than non-splitting firms. We might expect this because splitting firms have more accurate earnings forecasts than non-splitting firms. To address this question, each month I divide the companies in the Russell 1000 into quintiles based on the forecasts generated by the First Quadrant earnings forecast model (EFM).[5] Starting January 1990, I simulate the strategy of buying only the stocks in the best and worst EFM quintiles each month and calculate their cumulative excess return by the end of 1996. I then compare this with another simulation which buys only those stocks in the best and worst quintiles that announced a split in the previous two years. The cumulative excess returns are plotted in Exhibit 5.

It is evident that the earnings forecast signal is much more informative for splitting firms than the average firms in the Russell 1000 universe. In fact, if we had invested in the companies in our best EFM quintile every

Exhibit 4.

Excess Returns For Two Split-Based Trading Rules.

	Panel A: Trading Rule 1				Panel B: Trading Rule 2			
	Splitting Firms		Non-Splitting Firms		Splitting Firms		Non-Splitting Firms	
Year	Mean #stocks	Cumulative excess return	Mean #stocks	Cumulative excess return	Mean #stocks	Cumulative excess returns	Mean #stocks	Cumulative excess returns
1979	74.6	24.97	76.3	17.66	43.3	37.12	41.3	28.90
1980	121.8	16.63	126.1	9.71	56.2	35.08	57.1	20.93
1981	176.9	1.89	176.7	10.15	75.2	4.26	69.4	10.76
1982	174.2	0.56	180.1	-0.18	36.8	1.15	38.1	7.74
1983	142.4	4.63	148.3	11.07	53.3	12.42	42.8	9.77
1984	197.7	-3.20	199.7	-3.68	71.6	3.80	54.6	4.06
1985	216.3	8.82	217.3	3.13	57.8	17.14	49.9	15.47
1986	266.6	0.65	256.3	-7.10	87.6	3.28	64.8	-0.46
1987	364.2	-3.35	350.3	-8.40	134.2	8.11	109.4	6.84
1988	313.1	11.35	298.1	12.30	127.1	8.30	109.2	13.41
1989	186.3	-1.79	178.4	-9.30	69.7	4.58	57.9	8.59
1990	179.2	2.23	170.3	-7.73	51.0	4.04	46.0	-1.52
1991	190.5	19.02	184.4	13.72	51.6	37.80	53.4	24.21
1992	248.5	5.15	242.2	2.32	92.2	9.94	80.0	3.09
1993	330.2	5.04	321.3	5.04	120.6	10.29	101.9	5.44
1994	327.1	0.33	325.1	0.03	134.7	2.29	123.7	0.96
1995	283.1	1.21	272.4	-8.82	128.4	4.33	103.8	-5.98
1996	322.3	1.05	299.0	-6.30	119.2	3.73	94.8	-3.09
Total	228.6	5.29[a]	223.5	1.86	83.9	11.54[a]	72.1	8.29[a]

[a]t-statistic significantly different from zero at the 0.01 level.

[5] This is one of the proprietary models First Quadrant uses to make equity style forecasts.

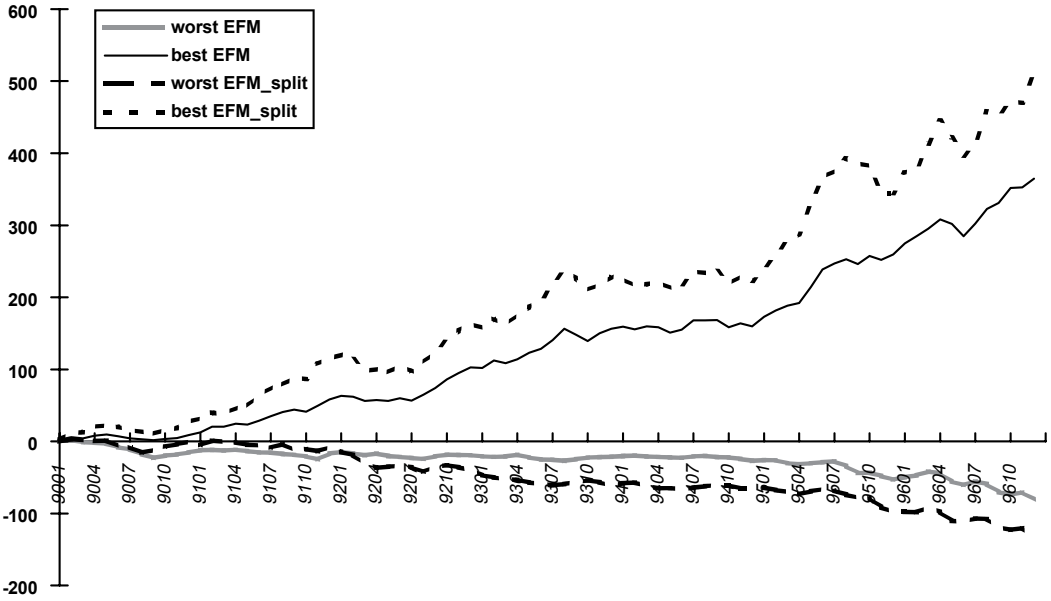
month since January 1990, we would have earned a return (without transactions costs) of 365% above the S&P 500 by the end of 1996. If instead we had invested only in the companies which announced a 2-for-1 or 3-for-2 split during the previous 2 years and which were in our best EFM quintile, we would have generated a 511% excess return by the end of 1996!

SUMMARY

Recent research suggests that stocks tend to outperform the market when 1) the underlying firms report better earnings than forecasted by analysts, or 2) when analyst forecasts of earnings are generally accurate. This suggests that good prediction of earnings surprises and earnings forecasts accuracy can enhance investment performance. This paper investigates the possibility that stock splits can help to improve such predictions. Stock splits are likely to be good predictors because of the "attention" effect. Splits serve as attention-getters for analysts to reassess the firm's value. As a result, the earnings forecasts errors are reduced after a stock split, and earnings forecasts signals are more informative for splitting than non-splitting firms. Given attention effects, companies announce a stock split because they are undervalued by the market. An implication is that positive earnings surprises are more probable for splitting firms.

Exhibit 5.

Cumulative Excess Returns On The Best And Worst Quintiles Based On The First Quadrant Earnings Forecast Model, With And Without Conditioning On Splits



Note: the "worst EFM" is the worst quintiles based on the First Quadrant earnings forecast model, the "best EFM" is the best EFM quintiles; the "worst EFM_split" is the stocks with split signals which were in the worst EFM quintile; and the "best EFM_split" is similarly defined.

Two trading rules are formulated to take advantage of the predictive ability of stock splits. I show that a simple trading strategy which essentially only buys splitting stocks generates an average annual excess return of 5.29% in simulation over 1979-1996. A slightly more complicated trading strategy based on both splits and earnings forecasts revisions yields an 11.54% annual excess returns over the same period. Furthermore, such a strategy outperforms the S&P 500 index in every year.

One limitation of split-based strategies is worth noting. Since only a small fraction of companies announce a split each month, a split-based trading strategy alone might pose difficulties for funds which try to track market indexes. However, proper combination of split-based signals and other signals will certainly improve forecasting power, and hence investment performance.

ENDNOTES

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