Overreaction in Stock Markets

Specifically Indian Markets

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October 26, 2022

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Effective Market Hypothesis

"One cannot consistently achieve returns in excess of average market returns on a risk-adjusted basis, given the information available at the time the investment is made."

Basically at any given time , people trading will be having the present information for making suitable trades and eventually reach its inherent value.

Stock Markets are generally Semi-Strong i.e. once new information is publicly available, the share price will rapidly adjust to the new information.

P/E Anomaly

Stocks with a lower P/E ratio shown to perform better than the ones with higher P/E

Inferred that this is due to a series of pessimistic decisions by Investors which drove the price way down. Once the future earnings turned reasonable, it eventually adjusted to its value.

Similarly stocks with higher P/E ratio are ”Overvalued” and prices would be driven down.

What does this mean?

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EMH and P/E effect

Based on these 2 effects, DeBondt and Thaler suggest 2 hypothesis.

Opposite Reaction

If a stock experiences significant price movement, then a subsequent price movement in the opposite direction is likely to follow.

Magnitude of Opposite Reaction

The level of extremeness is positively correlated between the initial and the following price movement.

Both hypotheses imply a violation of weak-form market efficiency which suggest that the price of a stock where share prices fully and fairly reflect all past information.

METHODOLOGY

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The data used is the monthly returns of stocks from Jan 1926 to Jan 1982 from NYSE.

- We then compute Cumulative Excess Returns.

$$CU_j = \sum_{t=1}^{t=t_1} u_{jt} \tag{1}$$

- The top x are categorized ”Good Performing Portfolio”
- The bottom x are considered ”Bad Performing Portfolio”

We can change t1 to 12,24 or 60 and x to infer results in a longer and general term.

METHODOLOGY

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- We then compute Cumulative Average Residual Returns

$$CAR_{G,1} = \sum_{t=1}^{t_1} \bar{u}_t \tag{2}$$

- And Average CARs for the test period

$$ACAR_{G,t} = \left(\sum_{n=1}^{t_1} CAR_{G,t} \right) / t_1 \tag{3}$$

Overreaction hypothesis states that the reaction is opposite i.e. for $t > 0, ACAR_{W,t} < 0$ and $ACAR_{L,t} > 0$, so that, by implication, $\left[ACAR_{L,t} - \ ACAR_{W,t}\right] > 0$

In order to assess whether, at any time t, there is indeed a statistically significant difference in investment performance, we need a pooled estimate of the population variance in CAR_t,

$$S_t^2 = \left[\sum_{n=1}^{N} \left(CAR_{W,n,t} - ACAR_{W,t}\right)^2 + \sum_{n=1}^{N} \left(CAR_{L,n,t} - ACAR_{L,t}\right)^2\right] / 2(N-1). \tag{4}$$

With two samples of equal size N, the variance of the difference of sample means equals $2S_t^2/N$ and the t-statistic is therefore

$$T_t = \left[ACAR_{L,t} - ACAR_{W,t}\right] / \sqrt{2S_t^2/N} \tag{5}$$

INFERENCES

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INFERENCE 1

Results consistent with the overreaction hypothesis. Over the last half-century, loser portfolios of 35 stocks outperform the market by, on average, 19.6%, thirty-six months after portfolio formation. Winner portfolios, on the other hand, earn about 5.0% less than the market.

INFERENCE 2

The overreaction effect is asymmetric; it is much larger for losers than for winners

INFERENCE 3

In months $t = 1, t = 13$, and $t = 25$, the loser portfolio earns excess returns of, respectively, 8.1% (t-statistic: 3.21), 5.6% (3.07), and 4.0% (2.76).

Table I

Differences in Cumulative Average (Market-Adjusted) Residual Returns Between the Winner and Loser Portfolios at the End of the Formation Period, and 1, 12, 13, 18, 24, 25, 36, and 60 Months into the Test Period

Portfolio Selection Procedures: Length of the Formation Period and No. of Independent Replications	Average No. of Stocks	CAR at the End of the Formation Period		Difference in CAR (t-Statistics)							
				Months After Portfolio Formation							
		Winner Portfolio	Loser Portfolio	1	12	13	18	24	25	36	60
10 five-year periods	50	1.463	−1.194	0.070 (3.13)	0.156 (2.04)	0.248 (3.14)	0.256 (3.17)	0.196 (2.15)	0.228 (2.40)	0.230 (2.07)	0.319 (3.28)
16 three-year periods	35	1.375	−1.064	0.105 (3.29)	0.054 (0.77)	0.103 (1.18)	0.167 (1.51)	0.181 (1.71)	0.234 (2.19)	0.246 (2.20)	NA*
24 two-year periods[a]	35	1.130	−0.857	0.062 (2.91)	−0.006 (−0.16)	0.074 (1.53)	0.136 (2.02)	0.101 (1.41)	NA	NA	NA
25 two-year periods[b]	35	1.119	−0.866	0.089 (3.98)	0.011 (0.19)	0.092 (1.48)	0.107 (1.47)	0.115 (1.55)	NA	NA	NA
24 two-year periods[a] (deciles)	82	0.875	−0.711	0.051 (3.13)	0.006 (0.19)	0.066 (1.71)	0.105 (1.99)	0.083 (1.49)	NA	NA	NA
25 two-year periods[b] (deciles)	82	0.868	−0.714	0.068 (3.86)	0.008 (0.19)	0.071 (1.46)	0.078 (1.41)	0.072 (1.29)	NA	NA	NA
49 one-year periods	35	0.774	−0.585	0.042 (2.45)	−0.076 (−2.32)	−0.006 (−0.15)	0.007 (0.14)	−0.005 (−0.09)	NA	NA	NA

[a] The formation month for these portfolios is the month of December in all uneven years between 1933 and 1979.
[b] The formation month for these portfolios is the month of December in all even years between 1932 and 1980.
* NA, not applicable.

RESULTS

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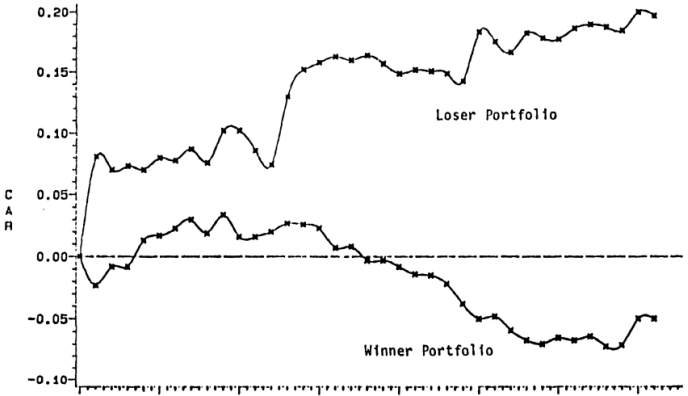
Average of 16 Three-Year Test Periods
Between January 1933 and December 1980
Length of Formation Period: Three Years



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The End

Questions? Comments?