

ECON3420 Tutorial Session

Efficient Market Hypothesis (EMH)

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Efficient Market Hypothesis

- ▶ *Asset prices fully reflect all available information*
- ▶ Utility maximization agents, rational expectation
- ▶ Expectation updates, random reactions

Weak-form efficiency

Asset prices already reflect all past publicly available information

Semi-strong-form efficiency

Asset prices reflect all publicly available information and instantly change to reflect new public information.

Strong-form efficiency

Asset prices reflect all information, including hidden "insider" information



De Bondt and Thaler (1985)

Individual decision making

- ▶ Individuals tend to overweight recent information and underweight prior data (Kahneman and Tversky, 1982)
- ▶ Even professional security analysts and economic forecasters display the overreaction bias (De Bondt, 1985)

Market behavior

- ▶ Excess volatility of security prices (Arrow, 1982; Shiller, 1981)
Dividends do not vary enough to justify the price movements
- ▶ Price earning ratio anomaly (Basu, 1977)
Stocks with extremely low P/E ratio earn larger risk-adjusted returns



De Bondt and Thaler (1985)

"Price-ratio" hypothesis

- ▶ Companies with low P/Es are thought to be "undervalued" due to bad reports or news
- ▶ Price adjusts once future earnings turn out to be better than unreasonable gloomy forecasts
- ▶ For explanatory purpose



De Bondt and Thaler (1985)

Hypothesis to be tested (Overreaction hypothesis)

1. Extreme movements in stock prices will be followed by subsequent price movements in the opposite direction
2. The more extreme the initial price movement, the greater will be the subsequent adjustment



De Bondt and Thaler (1985)

- ▶ Focus on stocks that have experienced extreme capital gains or losses in *formation period*, and construct "Winner" (W) and "Loser" (L) portfolios conditional upon past excess returns
- ▶ Efficient market condition

$$E\left(\tilde{R}_{jt} - E_m\left(\tilde{R}_{jt}|F_{t-1}^m\right) | F_{t-1}\right) = E\left(\tilde{u}_{jt}|F_{t-1}\right) = 0, \quad j = W, L$$

- ▶ Overreaction hypothesis

$$E\left(\tilde{u}_{Wt}|F_{t-1}\right) < 0 \quad \text{and} \quad E\left(\tilde{u}_{Lt}|F_{t-1}\right) > 0$$



De Bondt and Thaler (1985)

Main finding

- ▶ Loser portfolios outperforms the market by, on average, 19.6%, 36 months after portfolio formation
- ▶ Winner portfolios earn about 5.0% less than the market



De Bondt and Thaler (1985)

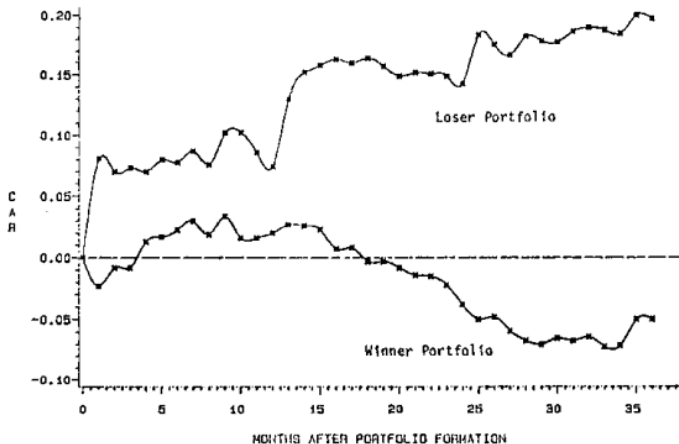


Figure 1. Cumulative Average Residuals for Winner and Loser Portfolios of 35 Stocks (1-36 months into the test period)



Fama (1998)

Fama's defence

- ▶ In an efficient market, apparent underreaction will be about as frequent as overreaction / some are hard to classify
- ▶ The long-term return anomalies are sensitive to methodology

Fama's critique

- ▶ long-term return studies rarely test **a specific alternative** to market efficiency.



Fama (1998)

In an efficient market, apparent underreaction will be about as frequent as overreaction

- ▶ Ball and Brown (1968); Bernard and Thomas (1990): stock prices seem to respond to earnings for about a year after they are announced
- ▶ Jegadeesh and Titman (1993): momentum effect, stocks with high returns over the past year tend to have high returns over the following three to six months



Some long-term return anomalies are difficult to classify

- ▶ Asquith (1983); Agrawal et al. (1992): negative long-term abnormal returns to acquiring firms following mergers

Why the market appears to overreact in some circumstances and underreact in others?

Chance



Reasons why EMH survive

- ▶ The literature does not present a random sample of events
- ▶ Some apparent anomalies may be generated by rational asset pricing
- ▶ The long-term return anomalies are sensitive to methodology

