Investment Portfolio Management Course
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An-Najah National University

Chapter 8: Efficient Market Hypothesis

Overview

- What is the Efficient Markets Hypothesis (EMH)?

  - Different versions of the EMH

  - Implications of the EMH

- Are markets efficient?

  - Anomalies

Introduction

- Before starting talking about the **Efficient Market Hypothesis (EMH)**, Let's learn some terminology:

- **Expected Return:**

$$E(R_i) = R_f + \beta_i[E(R_m) - R_f]$$

- **Abnormal Profit (Alpha):**

α Abnormal return (or alpha) = Actual return – Expected return

- **Beating the market:** means <u>consistently</u> earning a **positive abnormal return (+α)**.

Example

- Assume a stock has a beta of 1.0, the risk-free rate is 2% and the return on the overall market is 10%. What is the expected return?

- Suppose the stock actually earned a 12% return. What is its Alpha?

Technical and Fundamental Analysis

• Two techniques are commonly used to predict future prices:

> • *Technical Analysis*
>
> • *Fundamental Analysis*
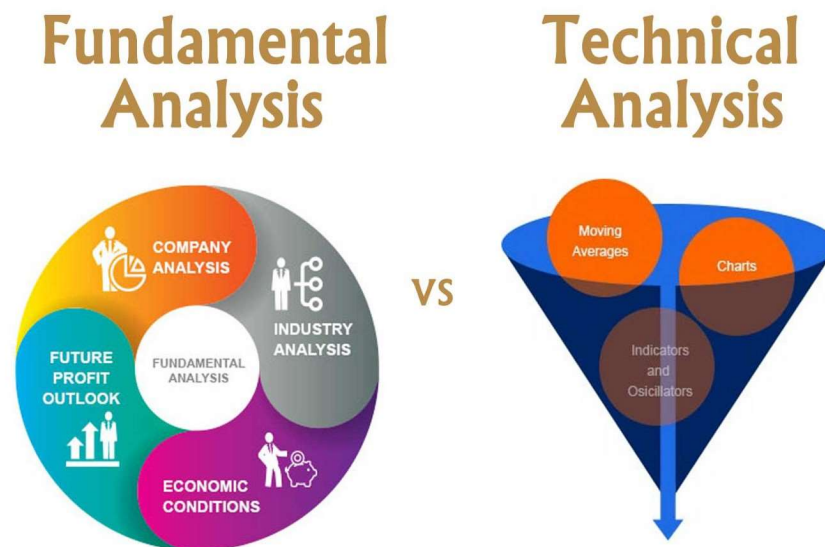
Factors Influencing Stock Price

Macro economy (including the FED)

The Industry

The Company

Technical Analysis (TA)

- **Technical Analysis:** the study of past market trading data primarily price and trading volume information to predict future price movements.

- Technicians believe that securities move in very predictable trends and patterns.

Technical Analysis (TA)

Technical Analysis (TA)

- Trends continue until something happens to change the trend

- Until that change takes place, price levels are predictable.

- Technical analysis involves the <u>development of trading rules</u> based on past price and volume data for individual stocks and the overall stock market.

Charting: Price Channels

ChevronTexaco (CVX) NYSE   © StockCharts.com
10-Apr-2000   Open 80.91 High 82.80 Low 80.61 Close 81.50 Volume 1.3M Chg -0.36 (-0.43%) ▼
ʬ ChevronTexaco 81.50 (Daily)

Main-trendline

Channel-line

Charting: Head and Shoulders

Moving Average (MA)

Fundamental Analysis (FA)

- Fundamental analysis involves economic, industry, and company analysis (EIC) that lead to valuation estimates for companies, which can then be compared to market prices to aid in investment decisions.

- Fundamental Analysis analyzing the financial data that is 'fundamental' to the company.

- It typically focuses on key statistics in a company's **financial statements** to determine if the stock price is correctly valued.

Fundamental Analysis (FA)

- Earning per share

- Price earnings ratio (P/E ratio)

- Dividend payout ratio

- Dividend yield ratio

- Price to book ratio

- Book value

- Price to sale

# Efficient Market Hypothesis (EMH)

- EMH formally developed and defined by Eugene Fama (2013 Nobel Prize winner).

- An efficient market is a market that efficiently processes information

  - Prices fully reflect all available information

  - Prices react quickly and correctly to new information

  - There is "no free lunch"

    - The only way you can get higher returns is by taking on more risk

    - If a market is efficient, it is not possible to "beat the market" (except by luck).

Example From Takeover Attempts

Patterns in returns after announcement is consistent with *market efficiency*!
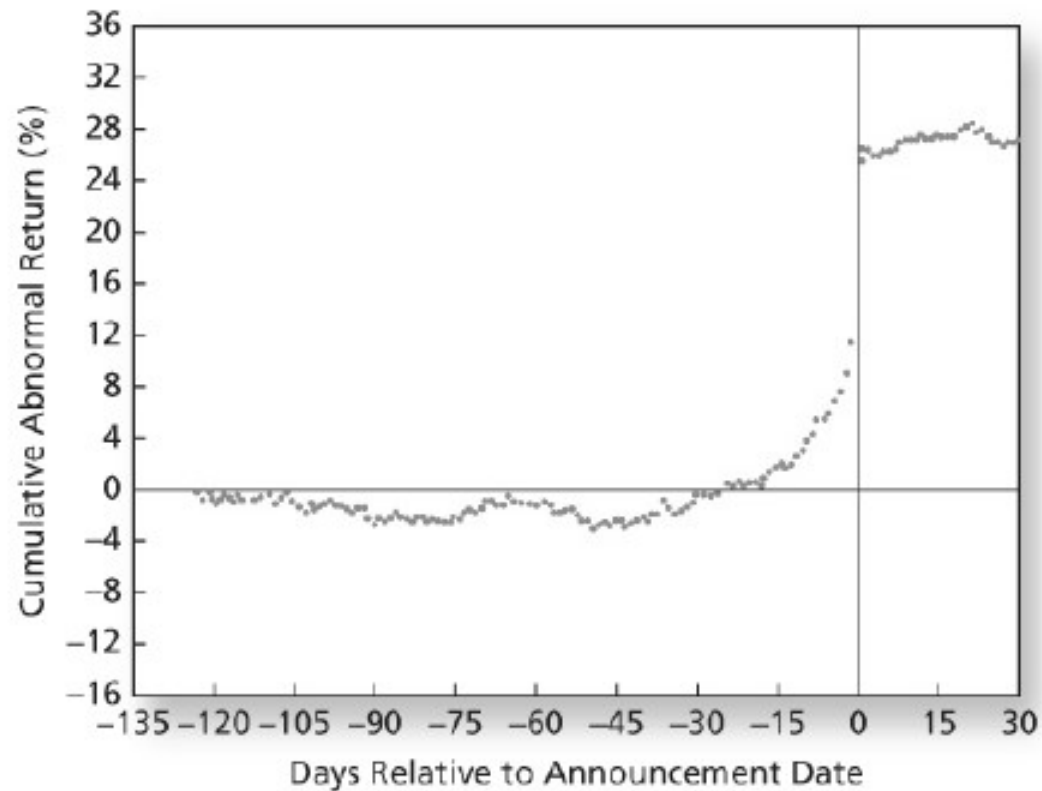
Example

MARKET EFFICIENCY IN REAL TIME

Market efficiency in real time[☆]

Jeffrey A. Busse, T. Clifton Green*

Goizueta Business School, Emory University, Atlanta, GA 30322, USA

Example: Stock price reaction to CNBC reports
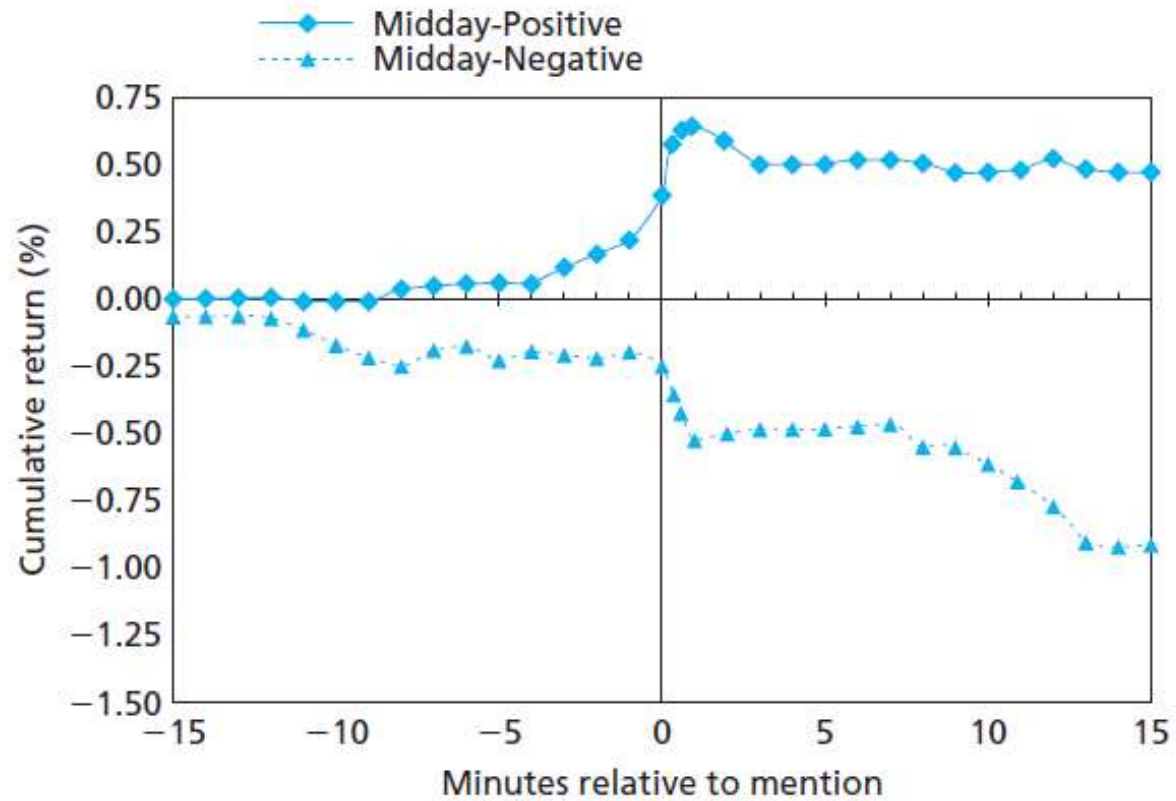
Why Would a Market be Efficient?

- The driving force toward market efficiency is simply competition and the profit motive.

- Even a relatively small performance enhancement can be worth a tremendous amount of money (when multiplied by the dollar amount involved).

- This creates incentives to unearth relevant information and use it.
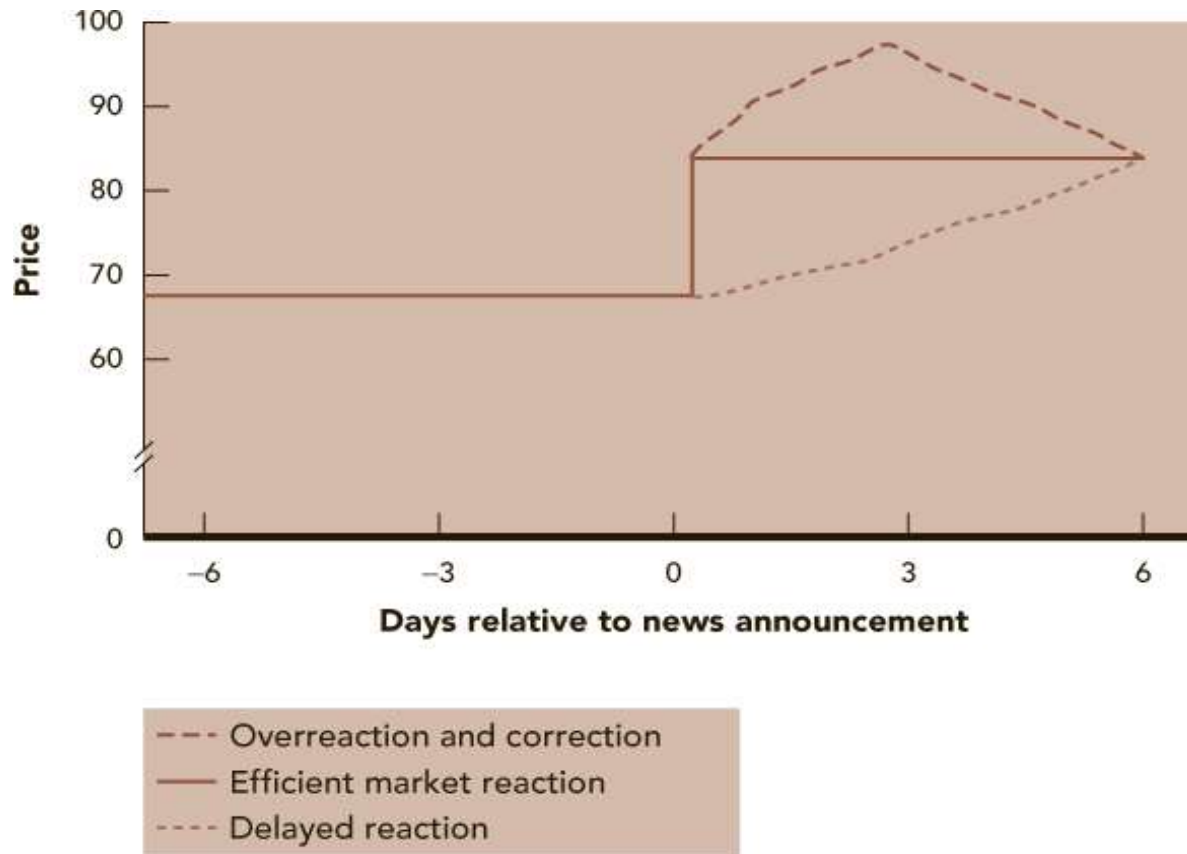
Forms of Market Efficiency

Each form is defined with respect to the available information that is reflected in prices.

How New Information Gets into Stock Prices

Forms of Market Efficiency

	Market prices reflect		
Forms of market efficiency	Past market data	Public information	Private information
Weak form of market efficiency	✓		
Semi-strong form of market efficiency	✓	✓	
Strong form of market efficiency	✓	✓	✓

Forms of Market Efficiency

- A **Weak-form Efficient Market** is one in which past prices and volume figures are of no use in beating the market. *(You can not use TA to predict future price change)*

  - Stock prices move at random.

  - **If so, then technical analysis is of little use.**

- A **Semistrong-form Efficient Market** is one in which publicly available information is of no use in beating the market.

  - **If so, then fundamental analysis is of little use.**

- A **Strong-form Efficient Market** is one in which information of any kind, public or private, is of no use in beating the market.

  - **If so, then "inside information" is of little use.**

Information Sets for Market Efficiency

Strong-form information set:
all information of any kind, public or private.

Semistrong-form information set:
all publicly available information.

Weak-form information set:
past price and volume.

Implications of the Efficient Market Hypothesis for IPM

- If securities markets are weak-form and semi-strong-form efficient, the implication is that active trading, whether attempting to exploit price patterns or public information, is not likely to generate abnormal returns.

  - Passive portfolio management should outperform active portfolio management.

  - Researchers have observed that mutual funds do not, on average, outperform the market on a risk-adjusted basis.

What Good are Portfolio Managers?

- The role of a portfolio manager is not necessarily to beat the market but, rather, to establish and manage a portfolio consistent with the portfolio's objectives, with appropriate diversification and asset allocation, while taking into consideration the risk preferences and tax situation of the investor.

Market Anomalies

- **Market Anomalies:** patterns in returns observed in the market that seem inconsistent with the EMH.

Sampling of Observed Pricing Anomalies

| Time Series	Cross-Sectional	Other
January effect	Size effect	Closed-end fund discount
Day-of-the-week effect	Value effect	Earnings surprise
Weekend effect	Book-to-market ratios	Initial public offerings
Turn-of-the-month effect	P/E ratio effect	Distressed securities effect
Holiday effect	Value Line enigma	Stock splits
Time-of-day effect		Super Bowl
Momentum		
Overreaction		

Time Series Anomalies

- Two of the major categories of time-series anomalies that have been documented are 1) calendar anomalies and 2) momentum and overreaction anomalies.

  - Calendar Effects:

    - Stock returns may be closely tied to the time of year or time of the week.

    - Example: January effect (the tendency of small-cap stocks to outperform large-cap stocks by an unusually wide margin in the month of January).

January Effect

- The January Effect is a term for the observation that certain types of stocks (e.g., value and/or small size) earn abnormally high returns in January.

Figure 1. January Excess Returns by Firm-Size Decile
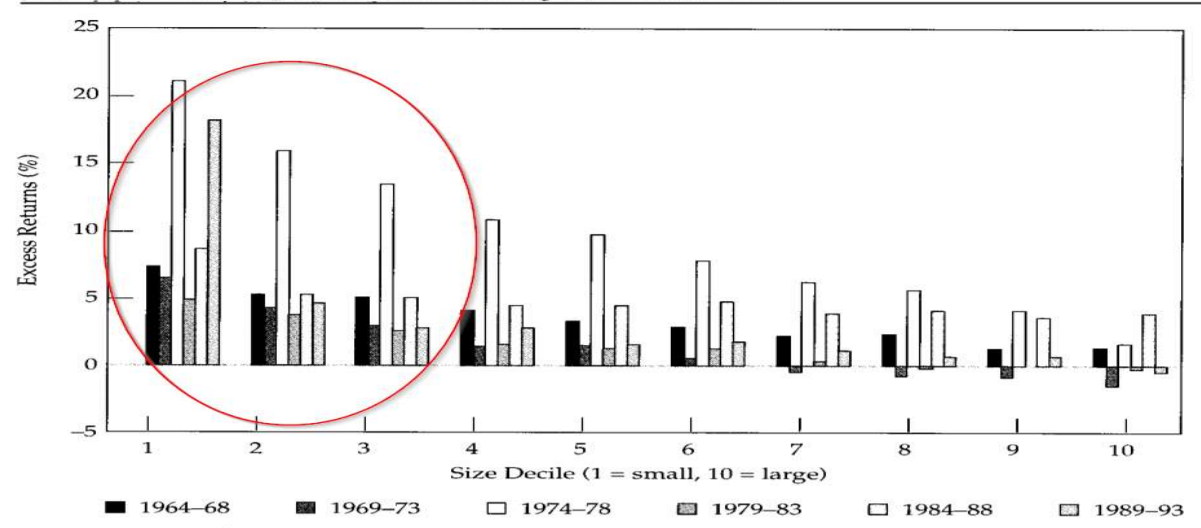
January Effect

- Two Possible Explanation:

  - **1) Tax loss Selling**

  - **2) Institutional Window dressing**

Calendar Anomalies

Calendar-Based Anomalies

Anomaly	Observation
Turn-of-the-month effect	Returns tend to be higher on the last trading day of the month and the first three trading days of the next month.
Day-of-the-week effect	The average Monday return is negative and lower than the average returns for the other four days, which are all positive.
Weekend effect	Returns on weekends tend to be lower than returns on weekdays.
Holiday effect	Returns on stocks in the day prior to market holidays tend to be higher than other days.

Momentum and Overreaction Anomalies

- Momentum relates to short-term share price patterns.

  - **Jegadeesh and Titman (1993):** Trading on the basis of longer horizon past returns can yield higher returns without higher systematic risk

  - **Past 6-12 month returns** exhibit MOMENTUM.

    - Strategy: Buying a portfolio of high past one-year return stocks (WINNERS) and shorting low past return stocks (LOSERS) yield high future returns without extra risk.

# Momentum and Overreaction Anomalies

- **Overreaction:** Trading on the basis of longer horizon past returns can yield higher returns without higher systematic risk.

  - investors overreact to the release of unexpected public information. Therefore, stock prices will be inflated (depressed) for those companies releasing good (bad) information.

- Past 3-5 year returns exhibit REVERSAL

  - Strategy: Selling high past 3-5 year return stocks (WINNERS), and buying low past 3-5 year stocks (LOSERS) have been a profitable strategy.

Cross-Sectional Anomalies

1) Size Effect (small firm Effect):

- Studies have shown that small-firms (low market capitalization) have historically high returns relative to their systematic risk.
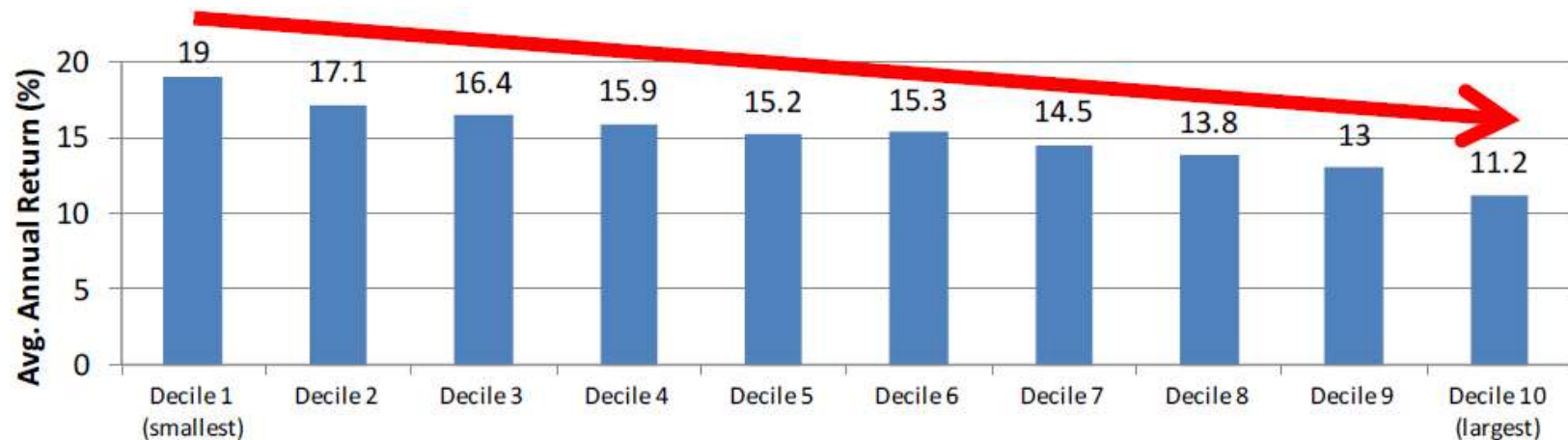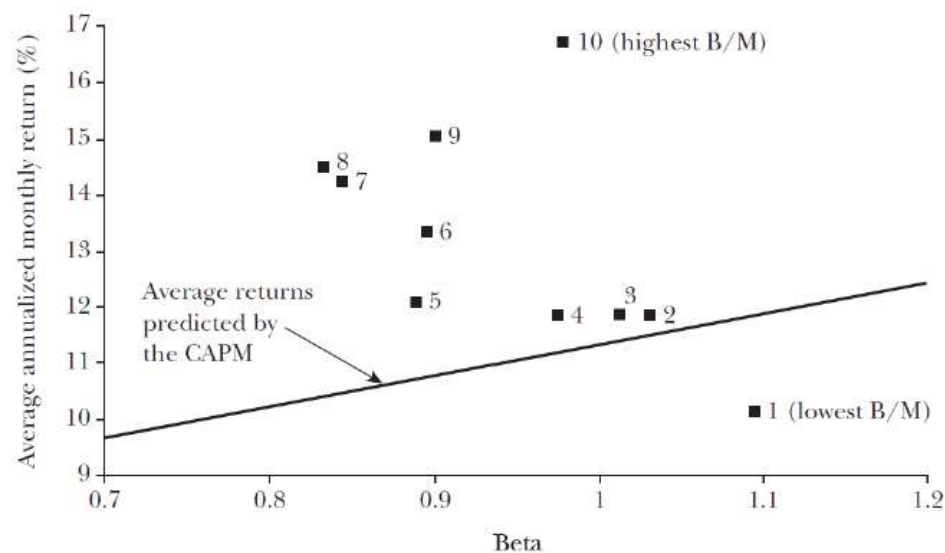
Cross-Sectional Anomalies

2) Value Effect

- Studies have shown that value firms (high book-to-market) have historically high returns relative to their systematic risk.

Value Strategies

- Invest in high book-to-market firms

- Invest in low price-to-earnings firms

- Invest in high dividends-to-price

- (high dividend yield) firms

Post-Earnings Announcement Drift (PEAD)

- Stock price adjustments may continue after earnings adjustments have been announced.

- This pattern seems to create an opportunity for investors to earn abnormal returns by purchasing stocks that have recently issued good earnings news or by short selling stocks that have recently delivered poor earnings results