EFFICIENT MARKETS HYPOTHESIS

WHAT WILL YOU LEARN?

- What is the Efficient Markets Hypothesis (EMH)?
  - Different versions of the EMH
  - Implications of the EMH
- So, are markets efficient?
  - Mutual fund and analyst performance
  - Anomalies

A LITTLE HISTORY

- Louis Bachelier in 1900 delivered his dissertation 'Theory of Speculation' to the Faculty of Sciences at the Academy of Paris for the degree of doctor of mathematical sciences:
  - No observable patterns in the fluctuations of prices.
  - Price movements in the securities market are random and therefore unpredictable.

A LITTLE HISTORY

- Alfred Cowles III worked on an ambitious five-year project in search of evidence that the stock market is predictable.
  - He studied a pool of 7,500 recommendations of individual stocks issued by sixteen financial services over four years.
  - No evidence that analysts could predict prices.

A LITTLE HISTORY

- Maurice Kendall studied British equity and commodity prices.
  - No indication that prices could predict future economic cycles.
  - More evidence prices moved randomly.
- Stock prices as Brownian motion

SUPPOSE PREDICTABILITY

- Suppose we can predict with confidence that the stock XYZ currently priced at \$100 will rise to \$110 in three days.
- What would investors do?
- Who would be willing to sell?

MORE GENERALLY…

- Any information that could be used to predict stock performance should already be reflected in stock prices.
- New information, by definition, is unpredictable.

SO THEN…

- Price changes should be random and unpredictable.

EFFICIENT MARKETS HYPOTHESIS

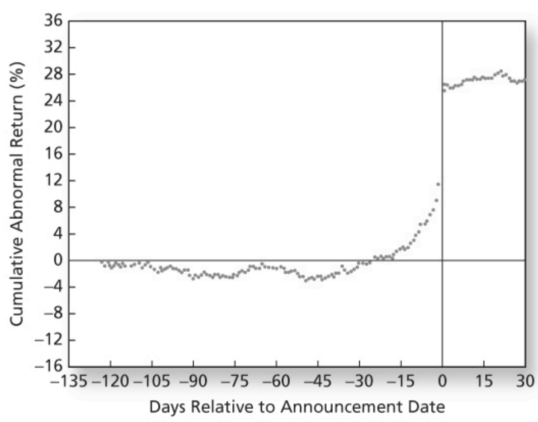
- The notion that prices already reflect all available information is referred as the Efficient Market Hypothesis (EMH).

SUMMARY

- 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

EXAMPLES OF EFFICIENT MARKETS: PRICES RESPOND QUICKLY TO NEW INFORMATION

EXAMPLE FROM TAKEOVER ATTEMPTS



MARKET EFFICIENCY IN REAL TIME

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Market efficiency in real time ☆

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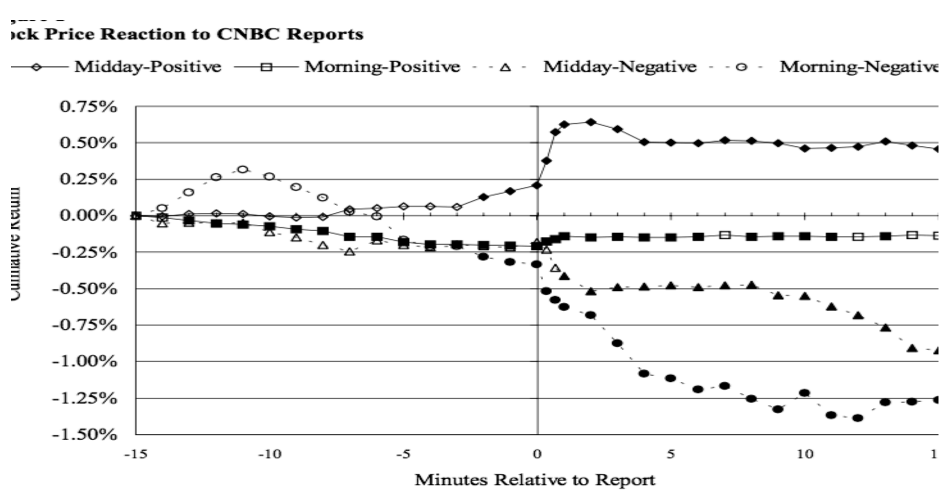
MARKET EFFICIENCY IN REAL TIME



SUMMARY

- Examples of prices adjusting very quickly to new information.

VERSIONS OF THE EFFICIENT MARKET HYPOTHESIS

WHAT WILL YOU LEARN?

- What are the different versions of the Efficient Markets Hypothesis?
  - It all depends on what you mean by 'available information'.
- So what? What are the implications of the EMH?

THE THREE VERSIONS OF THE EMH

- Weak-form EMH: prices reflect all past market trading information such as past prices, trading volume or short interest.
  - Implies trend analysis is useless!

THE THREE VERSIONS OF THE EMH

- Semi-strong form EMH: prices reflect all public information – in addition to past prices, all fundamental data on a firm's product line, financial data, accounting data.

THE THREE VERSIONS OF THE EMH

- Strong-form EMH: prices reflect all relevant information – public and even including information that is only available to insiders.

TECHNICAL ANALYSIS

- If markets are weak-form efficient, then technical analysis has no merit!

FUNDAMENTAL ANALYSIS

- If markets are semi-strong form efficient, then most fundamental analysis is also useless!
- The only way to reap benefits from fundamental analysis is if your analysis is better than any other competitor.

ACTIVE VS. PASSIVE MANAGEMENT

- If markets are efficient, then is there any value to active management?
- Proponents of EMH would say no and advocate a passive investment strategy.
  - The typical annual charge for an actively managed equity fund is 1% of assets vs. 0.17% for Vanguard's S&P 500 index fund.

SUMMARY

- The three different forms of the EMH – what defines 'all available information'?