Market Efficiency and Anomalies

Professor Lasse H. Pedersen

Outline

- Versions of the Efficient Market Hypothesis (EMH)
- Random Walk
- What makes the market efficient?
- Problems with testing EMH
- Evidence in favor of EMH
- Evidence against EMH: Anomalies

Versions of the Efficient Market Hypothesis (EMH)

- Weak-form efficiency:
  - prices reflect all information contained in past trading
- Semistrong-form efficiency:
  - prices reflect all publicly available information
- Strong-form efficiency:
  - prices reflect all relevant information, including inside information
- According to each of these theories, which kind of information **cannot** be used to trade profitably?

Random Walk

EMH implies that:

- a stock price is always at the "fair" level (fundamental value)
- a stock price reacts to news *immediately*
- a stock price changes only when the fair level changes
- therefore, stock price changes are *unpredictable* because no one knows tomorrow's news
- that is, the stock price is a "*random walk":*
  - tomorrow, the price can go either up or down
    - if the price must go up tomorrow – what would happen today?
  - the *risk-adjusted* likelihood of up- and down-movements are equal
    - if the price were extremely likely to go up tomorrow – what would happen today?

What Makes the Market Efficient?

- The market is made efficient by supply and demand pressures
  - If it is not efficient, investors will trade to take advantage of the inefficiencies
- But, if the market is already efficient
  - no one will expend resources on security analysis
  - every investor should just buy a mix of the risk-free security and the market portfolio
- Grossman-Stiglitz paradox: How can market be efficient if no one makes security analysis?
  - Two economists walk down the street and spot a $20 bill. One starts to pick it up, but the other one says: "don't bother; if the bill were real, someone would have picked it up already."

Economies of Scale in Securities Research

- If "beating the market" is possible, it is difficult
- To do so requires resources (time, money, data, computer power, insight, ideas, etc.)
- Economies of scale: expend resources only if
  - you have a lot of money, or
  - you manage a lot of money
- Small investors can beat the market only if there are "doubly inefficient markets":
  - the financial market is inefficient
  - the market for money management is inefficient

Problems with Testing EMH

- The lucky-event issue
  - if many people play the lottery someone will win. This does not imply that the winner has "ability."
  - if many people try to predict the future, someone will be right.
- Data mining
  - many researchers and market participants are looking for patterns in the data
  - even truly random samples, however, appear to have patterns ("hot-hand hypothesis")
  - in-sample predictability need not imply out-of-sample predictability.
- The joint-test issue
  - is the market inefficient or did you adjust for risk incorrectly?

Evidence in Favor of EMH

- Stock prices are close to random walks
- Stock returns have low serial correlation
- Stock returns are very hard to predict
- Portfolio managers
  - do not beat the market on average
  - almost no one beats the market *consistently*

Evidence Against EMH: Anomalies

- Bubbles
- Momentum
- Reversals
- Post-earnings announcement drift
- Small-firm effect
- Book-to-market effect