Session 12: Market Efficiency

Fall 2025

Outline

- Efficient markets
- Different versions of EMH
  - ✓ Weak-form efficiency
  - ✓ Semi-strong form efficiency
  - ✓ Strong-form efficiency
- Anomalies, i.e., violations of EMH
  - ✓ The value anomaly
  - ✓ CAPM failure
  - ✓ “Augmented CAPM”: Fama-French 3-factor model
- Implications for security analysis

Efficient Markets

- Efficiency = prices fully reflect all available information
- Efficiency does NOT mean
  - ✓Stock prices must go up on good news
  - ✓No one can ever outperform the market
- If markets were not efficient, investors would trade to take advantage of the inefficiencies
- Supply and demand and competition make it so

Different Versions of the EMH

1. Weak-form market efficiency: stock returns cannot be predicted using past stock returns
   - ✓ This is the *random walk hypothesis*
   - ✓ Evidence mostly suggests that past returns do not predict future returns; returns are not serially correlated
2. Semi-strong form market efficiency: stock returns cannot be predicted using any public information
   - ✓ Empirical test: event study
   - ✓ Studies suggest that abnormal returns to trading on most publicly available info are zero on average and disappear quickly

Different Versions of the EMH

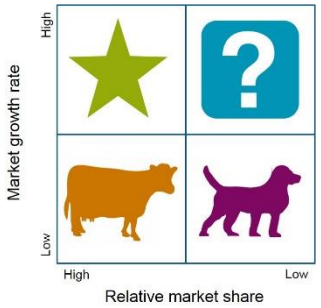
3. **Strong form** market efficiency: stock returns cannot be predicted from any information, public *or private*
   - ✓ Is that even possible?
   - ✓ Empirical evidence: corporate insiders earn abnormal returns
   - ✓ Conclusion: Markets are certainly **not** strong form efficient

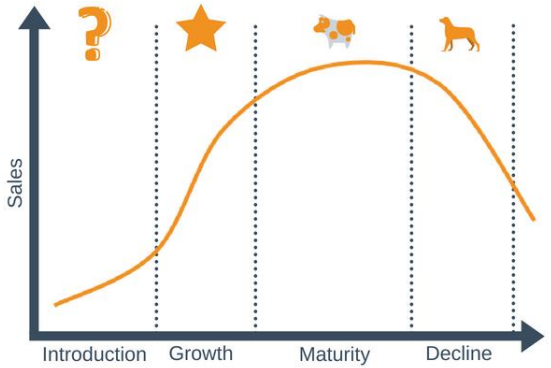
Version	Historical prices **Technical Analysis**	Public Information **Fundamental Analysis**	Private information **Insiders**
1. Weak-form	X		
2. Semi-strong form	X	X	
3. Strong form	X	X	X

Anomalies

- Anomalies = (apparent) violations of EMH
- January/small firm anomaly
- Book-to-market effect: high B/M firms (value firms) have higher abnormal returns than low B/M firms (growth stocks)

BCG Matrix





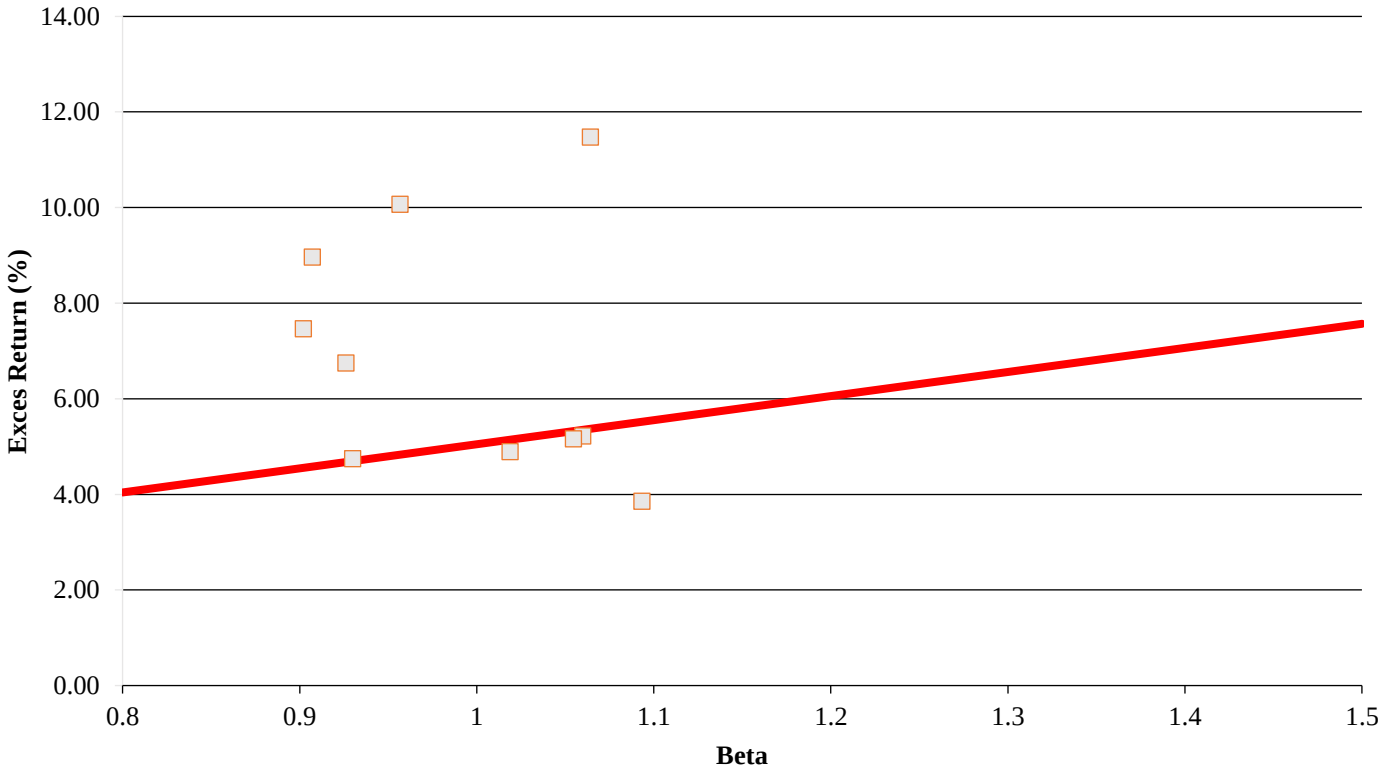
- Others: momentum, reversals, post-earnings announcement drift,…
- There are >50 anomalies documented in the published literature

The Value "Anomaly"

- Group all stocks each year in 10 portfolios, sorted on their book-to-market ratio (B/M deciles)
- Calculate value-weighted excess returns on these portfolios
- Run a SCL regression for each portfolio
  - ✓What are the βs?
  - ✓What are the average returns?
  - ✓What are the αs?

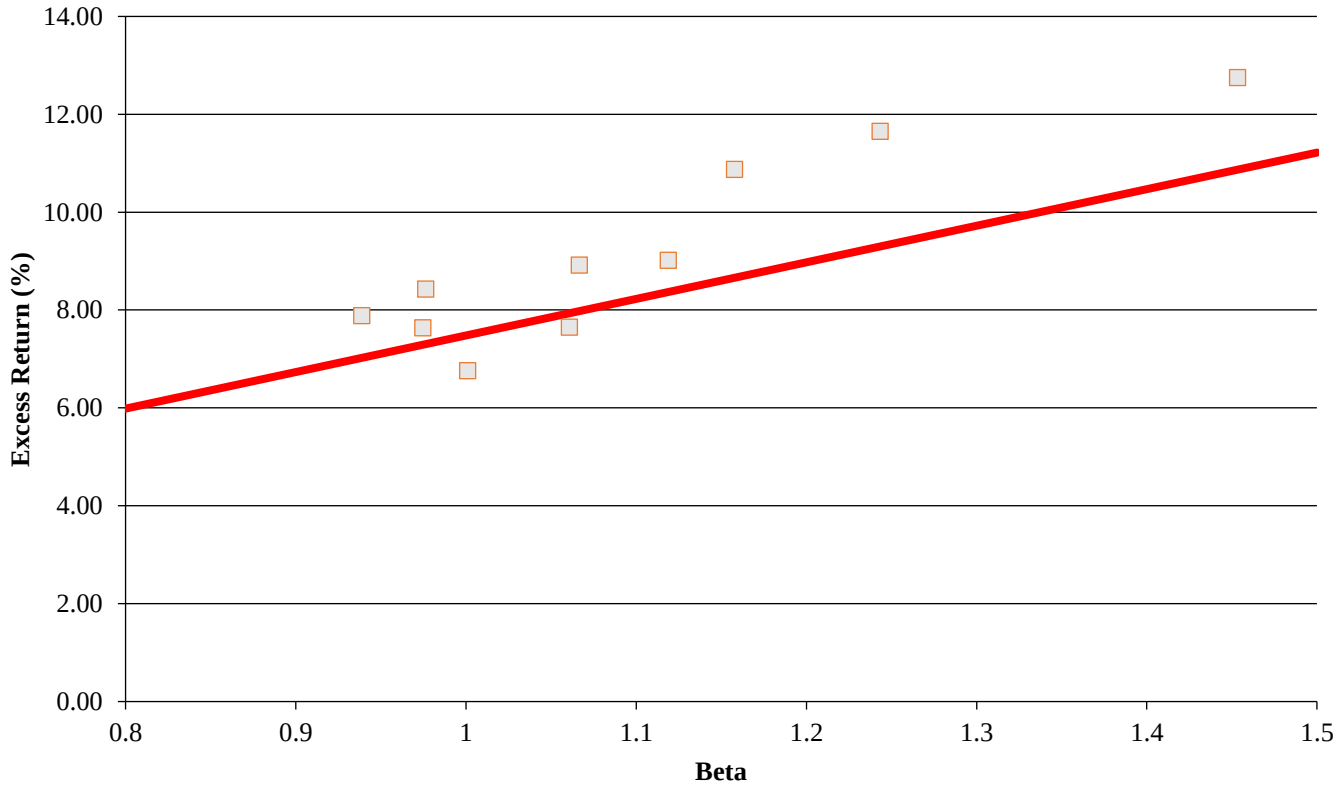
The CAPM is Dead!

1963-1992



Or Perhaps Not!

July 1926-July 2011



The Value "Anomaly"

- Average returns July 1926-July 2011 data (1021 months)
  - ✓10^{th} B/M decile: avg. annual excess return = 12.75%,
  - ✓1^{st} B/M decile: avg. annual excess return = 6.76%,
  - ✓Value spread = 12.75%-6.76%=5.99% per year
- CAPM alpha
  - ✓10^{th} B/M decile (value stocks): α =1.88%
  - ✓1^{st} B/M decile (growth stocks): α = -0.73%
- If you were a hedge fund manager what would you do?

The Fama-French 3-Factor Model

- Fama and French (1993) argue that this evidence is not inconsistent with the EMH
- Rather, it indicates that there is more than 1 source of systematic risk
- They add 2 new sources of systematic risk:
  - ✓Size factor (SMB): return on a portfolio that goes long small stocks and short big stocks
  - ✓Value factor (HML): return on a portfolio that goes long high B/M stocks and short low B/M stocks

The Fama-French 3-Factor Model

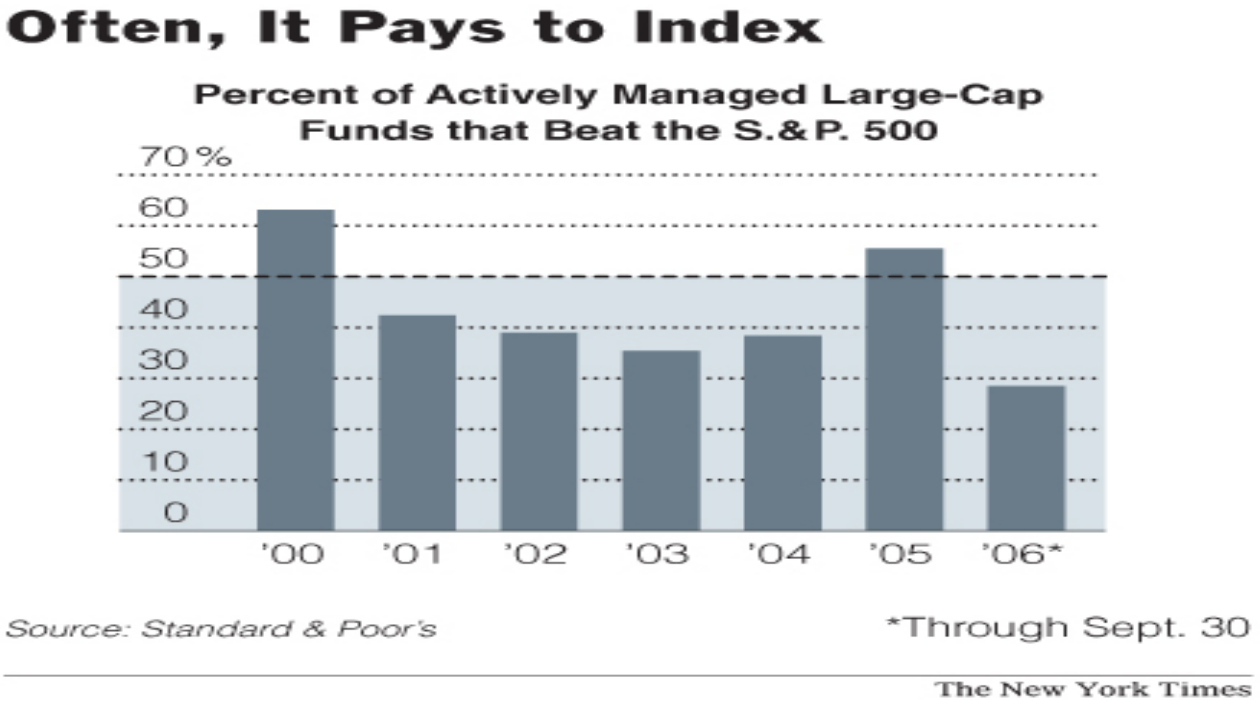
- Augmented SML:

$$E[r_i] - r_f = \beta_{iM}(E[r_M] - r_f) + \beta_{iS} SMB + \beta_{iBM} HML$$

- This model explains the returns on size and book-to-market portfolios
  (Is this a surprise?)
- Broader lesson: Testing EMH is plagued by a joint-test issue: Is the market truly inefficient or are you missing important sources of systematic risk?

Implications of the EMH

- Why should I be a securities analyst?
- Do mutual fund managers who actively manage their portfolio (as opposed to holding a passive index) earn abnormal returns? Sadly not…



Conclusion

- Markets are definitely not fully efficient!
- But it is not easy to make money
- Why?
  - ✓Inefficiencies are easier to see after the fact
  - ✓Inefficiencies tend to be small and in hard to trade assets
  - ✓Exploiting inefficiencies eliminates them