
Efficient Markets

- We now explore another important natural implication of a perfect market, which is that it is (more than likely) an efficient market.
- Historically, there has been much confusion here: most people mean perfect markets when they say efficient markets.
- Our coverage is highly abbreviated. (Investments will cover ME in much more detail.)

Set of Covered Topics

- General: The difference between Arbitrage and Great Bets.
- ME means roughly that “prices are set right.”
(Problem: what does right mean? We need to have a good model for the target.)
- Classification Schemes for Market Efficiency (ME).
Classical Finance vs. Behavioral Finance.
- Advantages of ME: you can learn from market values; and you know where you can add value and where not.
- Event Study Methods.

Efficient Markets (EM)

Q1: What does it mean to believe the market is efficient?

A Specific Example: PepsiCo

Efficient Market

The market estimates PepsiCo's expected value next year to be \$55 per share. It also estimates all other interesting characteristics, such as cash flows, market-betas, covariances, liquidity, etc.



Pricing Model

Say the CAPM is the correct pricing model. Then the financial market looks at PepsiCo's market beta, the risk-free rate, and the expected rate of return on the market, and sets PepsiCo's expected rate of return. Say this CAPM expected rate of return is 10%.



Today's Price

The price today is $\$55/1.1 = \50 per share.

(Q: What would you conclude to have gone wrong if you saw a price of, say, \$45.83 today?)

The General Case

Efficient Market

The financial markets estimate the statistical distribution of future cash flows, including their expected cash flow values, covariances, liquidity, and anything else possibly of interest.



Pricing Model

The financial market determines the appropriate expected rate of return, given all value-relevant characteristics.



Today's Price

The market sets today's price, so that the expected rate of return is as the model states.

More about Efficient Markets

11-?

Q2: Is there a link between perfect markets and efficient markets?

Q3: You see that the price of IBM is such that you expect it to earn 20% over the next year. Can you conclude that the market is inefficient?

Q4: What sort of claims would reject ME?

Q5: Is market efficiency a stronger concept over short intervals (a day) or over long intervals (a decade)?

Q6: In itself, is ME a very strong claim? As believer, how can you dispute someone doubting it?

Q7: What types of markets are more likely to be (in-) efficient?

Classifications (EM)

11-2

Traditional (11-3A): Focuses on information availability:

Strong Form: P reflects all public and private information. You cannot outperform (“make money”) even with insider information. (Noone believes this one.)

Semi-Strong Form: P reflects public, but not all private information. You cannot make money with public information.

Weak Form: P reflects so little public and private information that you cannot make money by plotting historical price patterns, but you can make money analyzing fundamentals.

Modern (11-3B): Focuses on the relation between price reflecting underlying value, and closely linked to behavioral finance:

True believer: P is always PV.

Firm believer: P may deviate from PV, but this is not exploitable.

Mild believer: P may deviate from PV, and this is mildly exploitable.

Non believer: P can be anything, and investors can get rich.

Signal-To-Noise Ratio

11-3

Why is the debate over ME so difficult to settle?

Q8: According to the CAPM or similar models, what do you expect the expected rate of return on a trading day be?

(This is based on random walk: $E(P_1) = P_0 + m + \epsilon$, where m is small.)

Transaction costs will further reduce this in an imperfect world.

Q9: What is the typical move up or down of a stock?

Signal = Mean. Noise = Standard Deviation.

Q10: How does risk (standard deviation) grow with holding period duration (time) in a random walk?

Confidence in Strategy

Q11: What is a T-statistic that gives you confidence?

Important: If you can expect to outperform by an extra 2% per year, you are a star! This is less than 1 basis points a day.

Presume you are a true superstar.

Q12: Over 1-day performance, what is your expected T-statistic?

Q13: Over 100-day performance, what is your expected T-statistic?

Q14: Over 10,000-day performance, what is your expected T-statistic?

Q15: What is the problem in testing for ME?



Arbitrage vs. Great Bets

11-4

Q16: What exactly is arbitrage?

Q17: What is a great bet?

Q18: Would you prefer an arbitrage or a great bet?

Q19: Do you believe it is easy to find either?

Important: Financial models typically impose the belief that there is a scarcity or total absence of either great bets or arbitrage.

Technical Analysis

11-5A

Q20: What sort of price/return patterns should not be observable?

Q21: How should the relation between yesterday's return and today's return look like?

The Evidence

First-order: ok.

Second-order: Momentum Works.

ME 2: Stock Picking?

11-5B

Q22: If you can beat the market, who would you ask to confirm it?

Q23: How much data do you need?

Q24: How do funds get started?

Q25: How many funds should outperform the market 10 years in a row *if none* have skills?

Q26: How many funds should outperform the market 10 years in a row *if some* have skills?

Q27: Among *existing*, large funds, how many funds should have outperformed the market with/without skills?

Q28: Who would get the rents from ability?

Q29: If you were an investment manager having made 5% per year above your benchmark 5 years in a row, what would you think of your ability?

Q30: What do you think of contingent compensation—you pay only if I give you a profitable stock pick?

Empirical Evidence: Pretty consistent with ME, except momentum and maybe value/growth strategies—though there appears to be “fat-tail” risk.

ME 3: Corporate Consequences

11-6

Q31: Any ideas?

Q33: What should you do if your shares are undervalued?

Q34: What should you do if your shares are overvalued?

ME 3: Event Studies

Event studies are another way to determine value without having to forecast cash flows. They work in some circumstances, but not others.

Q35: How long should it take for the market to incorporate new information into the asset price?

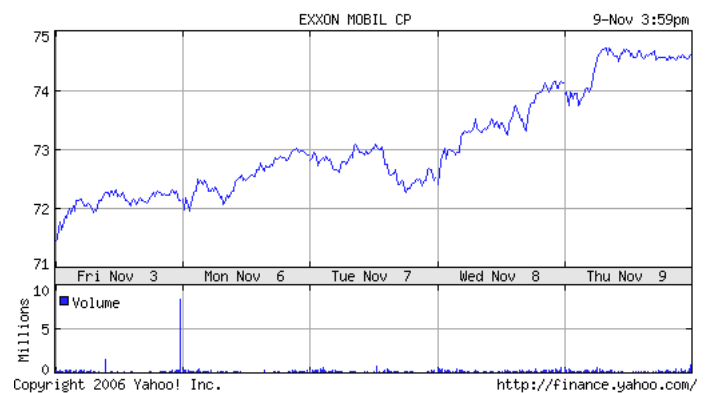
Q36: Should you be able to earn excess returns if you trade based on information released two hours ago?

Q37: Should you be able to earn excess returns if you trade based on facts that were widely expected to occur?

Q38: What should happen when a firm (or the government) makes an announcement?

Midterm Election in 2006

- From Tuesday to Wednesday, Democrats won both the Senate and the House.
- The Democrats' platform called for health-care reform.
- The previous Republican Senate and administration were very favorably inclined towards the Oil&Gas industry. (Bush-Cheney were both Texas oil men.)



Q39: What can you conclude from these reactions?

Q40: Do these changes reflect the entire market value increase due to the Democrat win?

Q41: What criteria matter in deciding whether event studies are likely to help?

Some Other Event Studies

Q42: Can we use ME to determine what sort of corporate actions or laws/regulations are good or bad?

Q43: What kind of other events may be usefully explored?



Homework Assignment

1. Reread Chapter 11.
2. Read Chapter 12.
3. Hand in all Chapter 11 end-of-chapter problems, due in 7 days.