

# Lecture 10: The Efficient Market Hypothesis

ECON435: Financial Markets and the Macroeconomy

Anton Korinek

Spring 2011

1

## Review: CAPM

### The capital asset pricing model:

- All investors hold the market portfolio
- The market portfolio is efficient
- The risk premium on the market portfolio is determined by investors' risk aversion
- The risk premium on an individual asset is

$$E[r_i] = r_f + \beta_i(E[r_m] - r_f)$$

$$\text{where } \beta_i = \frac{\text{Cov}(r_i, r_m)}{\sigma_m^2}$$

2

## The EMH: History

Maurice Kendall (1953): first computer study of stock market prices:

- no predictable pattern in stock prices
- prices seemed to move randomly

- result at first disappointing
- later: people realized this was a sign of market efficiency

3

## The EMH: Intuition

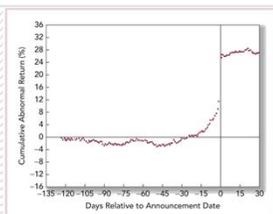
If any information can be used to predict future stock prices:

- traders buy/sell the stocks
- stock prices adjust immediately to the new information
- any future price movements are unpredictable

- stock prices reflect all available information
- future stock prices follow a *random walk*

4

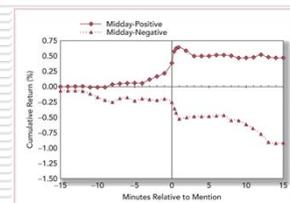
## The EMH: Examples



Stock market reaction to announcement of takeover

5

## The EMH: Examples



Stock market reaction to CNBC reports

6

## The EMH and Competition

- Stock prices fully reflect all publicly available information
- When new information becomes available, market participants immediately internalize it
- Competition assures that prices reflect new information quickly (investors that react first gain most)

7

## Three Versions of the EMH

1. Weak EMH: market prices reflect all information contained in past prices and trading behavior
2. Semi-strong EMH: market prices reflect all publicly available information
3. Strong EMH: market prices reflect all information relevant about firms, including private information

8

## Technical Analysis and EMH

### Technical Analysis:

- use past price and volume data to predict future stock movements:
  - momentum, relative strength
  - trend lines
  - resistance levels
- inconsistent with weak EMH
- whenever price patterns are discovered, they no longer work

9

## Fundamental Analysis and EMH

### Fundamental Analysis:

- use data about firm fundamentals to predict future stock movements:
  - earnings potential, dividends, risk
  - evaluation of management
  - macroeconomic environment
- inconsistent with semi-strong EMH

10

## Portfolio Management

- Active portfolio managers: try to pick stocks based on technical or fundamental analysis
  - higher costs
  - if EMH holds, waste of money
- Passive portfolio managers: invest in the entire market portfolio, e.g. index funds
  - lower costs

11

## Portfolio Management

### Portfolio Managers:

- not great fans of the EMH (which implies that much of their work is a waste of time)
- BUT: Role of Portfolio Management under EMH:
- diversification
  - minimizing of tax burden
  - implementing appropriate risk level

12

## Problems in Testing the EMH

1. *Magnitude Issue*: stock returns are random  
→ it is hard to tell whether outperformance was due to skill
2. *Selection Bias Issue*: if somebody found a winning strategy, they would keep it private to continue to make money
3. *Lucky Event Issue*: Difficult to judge whether returns are due to luck or due to skill

13

## Weak-Form Tests of the EMH

Some evidence for:

- short-term momentum  
→ momentum strategy
- long-term reversal  
→ contrarian strategy

Can be explained by “fads hypothesis:”  
overreaction to news

14

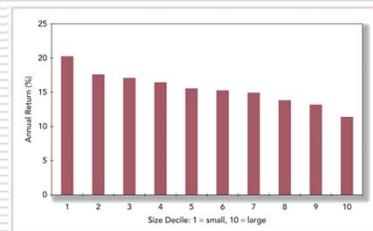
## Tests of Semistrong EMH

Market Anomalies:

- P/E Effect
- Small Firm Effect
- Book-to-Market Ratios
- Post-Earnings Announcement Price Drift

15

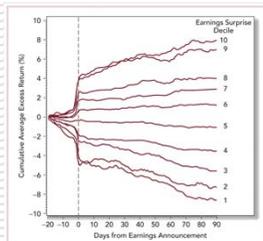
## Evidence on Small-Firm Effect



Average return for 10 size-based portfolios

16

## Post-Earnings Drift



Average return in response to earnings announcements

17

## Interpretation of Tests

Two conflicting views:

1. Different returns are due to different risk premia
2. Tests indicate rejection of EMH

18

## Performance of Analysts & Funds

Evidence on stock analysts:

- mixed

Evidence on return persistence in mutual funds:

- mixed
- influenced by survivorship bias