

# Are Financial Markets Efficient?

## Chapter 6

# Roadmap

- The Efficient Market Hypothesis
- Stronger Version of Efficient Market Hypothesis
- Evidence on the Efficient Market Hypothesis
- Evidence Against Market Efficiency
- Behavioural Finance

# The Efficient Market Hypothesis

- The prices of securities in financial markets fully reflect all available information

$$R = \frac{P_{t+1} - P_t + C}{P_t}$$

$$R^e = \frac{P_{t+1}^e - P_t + C}{P_t}$$

$$P_{t+1}^e = P_{t+1}^{of}$$

$$R^e = R^{of}$$

$$R^e = R^*$$

$$R^{of} = R^*$$

Current prices in a financial market will be set so that the optimal forecast of a security's return using all available information equals the security's equilibrium return.

### Example 6.1

# Rationale behind the hypothesis

- Arbitrage, in which market participants (arbitrageurs) eliminate unexploited profit opportunities, i.e., returns on a security that are larger than what is justified by the characteristics of that security.
- Pure arbitrage – no risk

$$\left. \begin{array}{l} R^{\text{of}} > R^* \rightarrow P_t \uparrow \rightarrow R^{\text{of}} \downarrow \\ R^{\text{of}} < R^* \rightarrow P_t \downarrow \rightarrow R^{\text{of}} \uparrow \end{array} \right\} \text{until } R^{\text{of}} = R^*$$

- In an efficient market, all unexploited profit opportunities will be eliminated
- Not everyone in a financial market must be well informed about a security or have rational expectations for its price to be driven to the point at which the efficient market condition holds

# Stronger Version of the Efficient Market Hypothesis

- Not only do scientists define an efficient market as one in which expectations are optimal forecasts using all available information, but they also add the condition that an efficient market is one in which prices reflect the true fundamental value of securities.
- In an eff. Market prices are always correct and reflect **market fundamentals**

# Implications of the above

1. In an eff. market one investment is as good as any other because the securities prices are always correct
2. A security's price reflect all available information about the intrinsic value of the security
3. Security prices can be used by managers of both financial and non-financial firms to assess their cost of capital accurately and hence that security prices can be used to help them make the correct decisions about whether a specific investment is worth making or not

# Evidence on the Efficient Market Hypothesis

- Evidence in favour of Market Efficiency
  - Performance of investment analysts and mutual funds
    - One implication is that you cannot beat the market
    - “Investment Dartboard”
    - Mutual funds did not beat the market
  - Conclusion: having performed well in the past does not indicate that an investment adviser or a mutual fund will perform well in the future.



# Evidence on the Efficient Market Hypothesis

- Do stock prices reflect publically available information?
  - Favourable stock announcements do not, on average, cause stock price to rise
- Random-walk behaviour of stock prices
  - Future changes on stock prices should, for all practical purposes, be unpredictable
- Technical analysis-popular technique to predict stock prices

# Evidence Against Market Efficiency

- Small firm effect
  - Due to rebalancing of portfolios by institutional investors, low liquidity of small-firm stocks, large information costs in valuing small firm, etc
- January Effect
  - Inconsistent with random walk behaviour
- Market overreaction
  - Pricing errors are corrected slowly to news announcements
  - Investor can earn abnormally high returns

# Evidence Against Market Efficiency

- Excessive volatility
  - Fluctuations in stock prices may be much greater than is warranted by fluctuations in their fundamental value.
  - Robert Shiller, fluctuations in S&P 500 could not be justified by the subsequent fluctuations in dividends of the stocks making up index.
- Mean reversion
  - Stocks with low return today tend to have high returns in the future, vice versa
  - Not a random walk

# Evidence Against Market Efficiency

- New information is not always immediately incorporated into stock prices
  - On average stock prices continue to rise for some time after the announcement of unexpectedly high profits and they continue to fall after surprisingly low profit announcement

# Overview of the Evidence on the EMH

- How valuable are publishable reports by Investment Advisors?
  - We cannot expect to earn abnormally high return, a greater than the equilibrium return
  - Human investment advisors in San Francisco do not on average even outperform an orangutan!
  - A person who has done well regularly in the past cannot guarantee that he or she will do well in the future

# Overview of the Evidence on the EMH

- Should you be skeptical of hot tips?
  - If this is new information and you get it first...
- Do stock prices always rise when there is a good news?
  - A puzzling phenomenon: when good news is announced, the price of the stock frequently does not rise.
  - **Stock prices will respond to announcements only when the information being announced is new and unexpected**
    - Prices reflect publically available information
    - Sometimes a stock price declines when good news is announced. Why?

# Overview of the Evidence on the EMH

- Efficient market prescription for an investor
  - Hot tips, investment advisors, technical analysis cannot help the investor to outperform market (because judgment is based on publically available information)
  - “buy and hold” strategy – fewer brokerage commission paid
  - Invest in no-load mutual fund

# Behavioral finance

- Applies concepts from other social sciences as anthropology, sociology, and particularly psychology, to understand the behavior of securities prices
  - Can smart money dominate ordinary investors so that financial markets are efficient?
  - People tend to be overconfident in their own judgment
    - Explains why securities market have so much trading volume
    - Stock market bubbles