FINA 1082 Financial Management

Dr Cesario MATEUS
Senior Lecturer in Finance and Banking
Room QA257 – Department of Accounting and Finance

c.mateus@greenwich.ac.uk
www.cesariomateus.com

Lecture 8

Capital Market Efficiency

November, 16, 2011

Objectives

- Examine the concept of capital market efficiency
- Examine the types of information related to market efficiency
- Examine the role of market analysis in an efficient market
- Outline some tests of market efficiency and the evidence
- Examine the implications of market efficiency

Concept of Capital Market Efficiency

A market is informationally efficient if prices instantaneously and unbiasedly reflect all available, relevant information

- An instantaneous price reaction
  - Any unexpected "news" is fully reflected in the price by the time of the next trade
  - Unexpected news arrives randomly and can be "good" or "bad"

- An unbiased price reaction
  - A biased reaction occurs when the price "overreacts" or "under reacts" to "news"
  - Example: Bad news hits the market which implies that the price of a stock should fall by $1.50 from $5.00. Some market participants "panic" and offer to sell their shares at $3.00
  - In an unbiased market the stock should trade at $3.50 after the news announcement

Market Efficiency - Main Assumptions

- A large number of profit-maximizing participants are analyzing and valuing securities independently of each other

- New information comes to the market in a random manner and the timing of news announcements is independent of each other

- Market participants adjust their estimates of security prices rapidly to reflect their interpretation of the new information received
    - Does not mean that market participants correctly adjust prices
    - Some participants may over-adjust and others may underadjust, but overall their price adjustments will be unbiased

Types of Capital Market Efficiency

- Definition of capital market efficiency is quite restrictive
  - Capital markets may be efficient, but not all the time and in all cases

- We consider three graduated forms of market efficiency
  - Weak form
  - Semi-strong form
  - Strong form

- For each type of market efficiency we need to
  - Define the classification
  - Explain how that type of efficiency may be tested
  - Explain the implications of each type for investment purposes

Weak Form of Market Efficiency

- Information on past prices is fully reflected in current prices

- Past prices cannot help investors earn returns in excess of what other investors are earning on similar risk securities

- Implication: The best predictor of tomorrow's price (P_{t+1}) is the price today (P_t)
  - Prices follow a random walk - successive price changes are random (irregular) over time
  - $P_{t+1} = P_t + \varepsilon_t$ where εt is a random error term
  - Alternatively, $\varepsilon_t = P_{t+1} - P_t$

Semi-Strong Form of Market Efficiency

- All publicly available information is fully and instantaneously reflected in current market prices

- Examples: Announcements of earnings and dividends, share buybacks, stock splits, mergers, takeovers, etc

- Implication: Past and currently available information is fully reflected in current market prices
  - Investors cannot use any publicly available information to *"beat the market"*
  - Note: A market cannot be semi-strong form efficient if it is weak form inefficient

Strong Form of Market Efficiency

- All information, public and private, is fully reflected in prices
- The market does not neglect any relevant information
- Implication: Since all information is impounded in prices fully and instantaneously it will be useless in predicting future prices (and returns)
- Implications of strong form inefficiency: Company insiders with inside information may exploit their private information to earn "excess" or "abnormal" returns/profits
- Note 1: A market can be semi-strong form efficient but not necessarily strong form efficient
- Note 2: Stock exchanges typically actively monitor and prevent insider trading

Market Analysis and Market Efficiency

•The type of information analysts use depends on their belief regarding what information is reflected in market prices

- •Technical analysts
- • Fundamental analysts
- • “Middle of the road” analysts

• Technical analysts (chartists) believe weak form inefficiency

- •It’s possible to “beat the market” trading on past price movements and trends

• Fundamental analysts believe in weak form efficiency

- • Earning “abnormal” returns/profits requires gathering and analyzing information
- • Forecasting future earnings, dividends and other fundamentals better than other investors increases the chance of earning abnormal returns/profits

Market Analysis and Market Efficiency

- Most empirical evidence indicates neither type of analysis has been effective in earning abnormal returns consistently, after transactions costs
  - Continuous market analysis is what makes financial markets efficient!

- Recent evidence on the existence of market anomalies may indicate the prevalence of "pockets" of market inefficiency
  - Can these anomalies be exploited consistently over time and after all costs are taken into account?

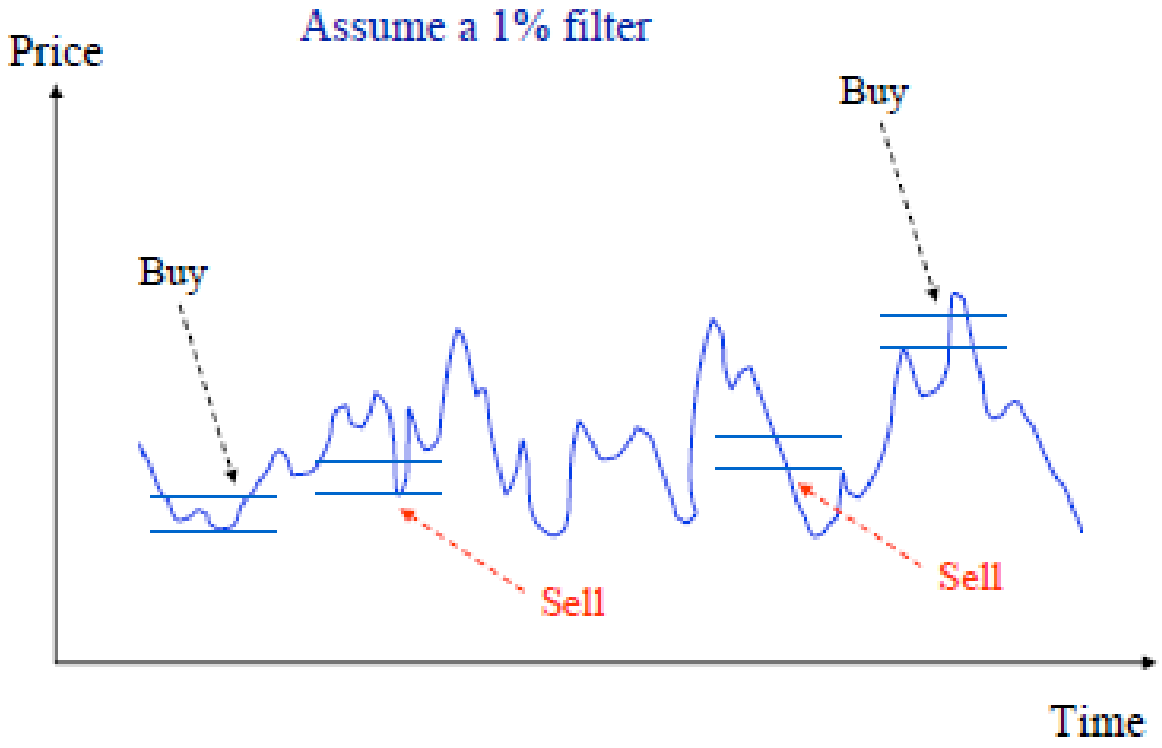
- Testing market efficiency typically involves using some model of asset prices (e.g., the CAPM)
  - Such tests are joint tests of market efficiency and the model
  - One can reject market efficiency if the asset pricing model is misspecified even if the market is efficient

Weak Form Market Efficiency

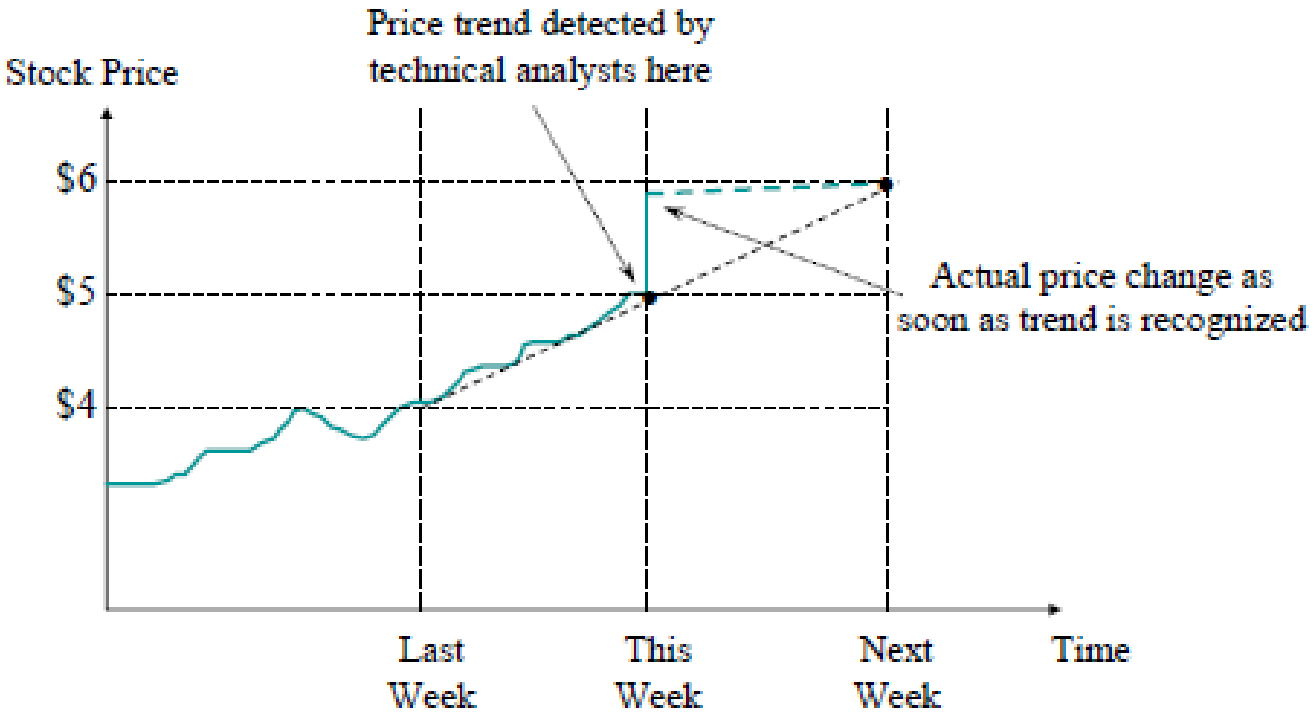
- Typical studies analyze the "random walk" nature of prices
  - Can past prices be used to predict future prices?
  - Is there a predictive relationship between past price changes and subsequent price changes?

- Filter rules used to analyze the profits from specific trading strategies of buying/selling securities depending on how their prices change over time
  - Buy (sell) a stock if price rises (falls) by 1%, 5%, etc.
  - Evidence indicates that some "small" filters may work, but not after transactions costs

Example of a Filter Rule



Weak Form Market Efficiency



Semi Strong Form Market Efficiency

- Event studies used to test semi strong form efficiency
  - Studies analyze market responses to new information
  - Identify an event which involves release of "news"
  - e.g., unexpectedly high/low earnings or dividends

- In an efficient market, "good" ("bad") news means an instantaneous upward (downward) price adjustment
  - Observed as "abnormal" returns at the announcement date

- Abnormal returns (ARt) typically estimated as the difference between observed returns and returns predicted by a model like the CAPM
  - $AR_t = r_t - [r_f + (r_m - r_f)\beta]$
  - $AR_t = 0$ on non-event days
  - $AR_t > 0$ for "good" news event on event day
  - $AR_t < 0$ for "bad" news event on event day

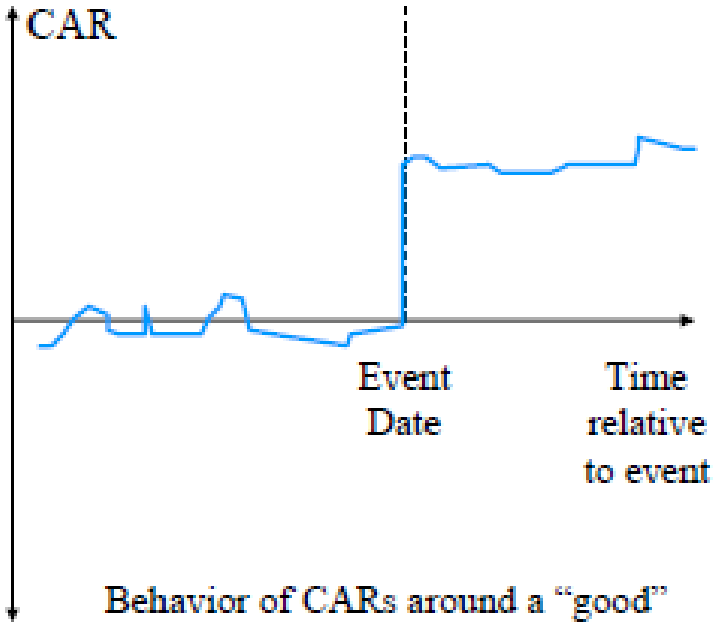
The Event Study Approach

•Cumulative abnormal returns (CARs) calculated by adding abnormal returns over time

- •$CAR_t = CAR_{t-1} + A_{rt}$
- •CARs show the total abnormal return earned over longer "event windows"

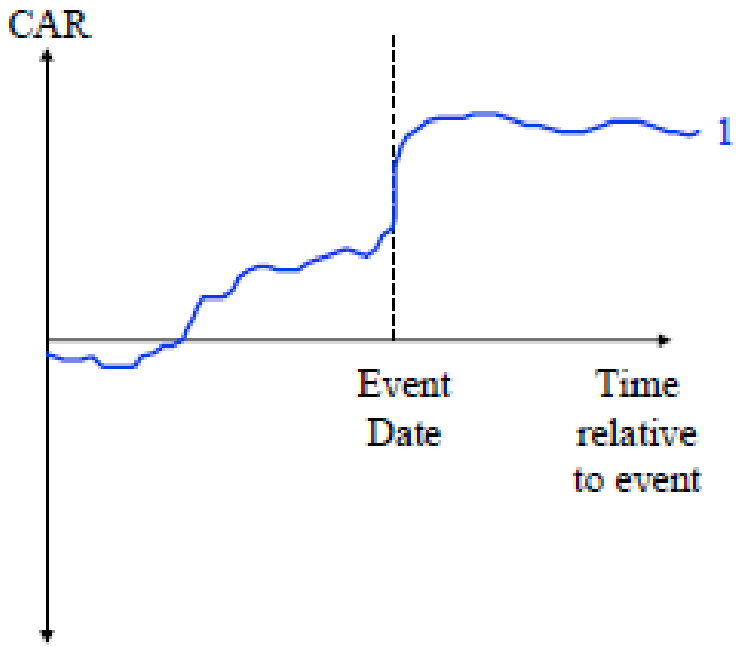
• In a semi-strong form efficient market, the CARs should

- • Have no discernible movement away from zero prior to the event
- • Jump at the event date
- • Have no discernible trend after the event date

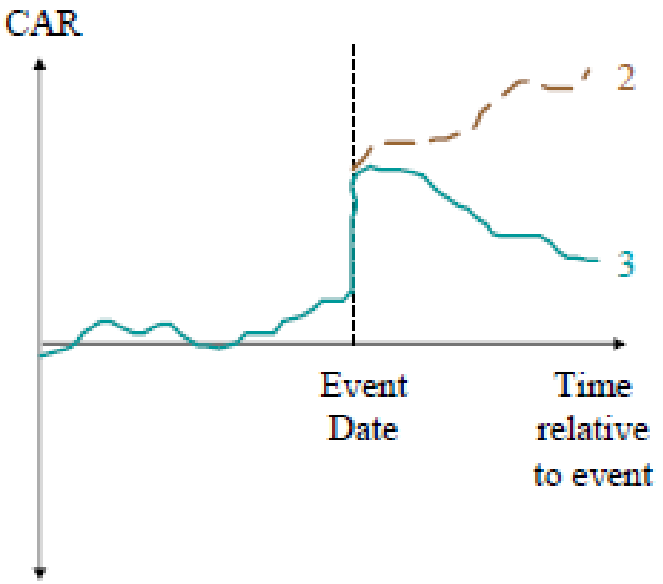


Behavior of CARs around a "good" news event

Different Types of Market Reaction



What type of market reactions are these consistent with?



Strong Form Market Efficiency

Trades by corporate insiders (US market)

- Insider purchasers have earned abnormal returns on their trades
- Outsiders following these trades can also earn abnormal returns
- Abnormal returns mainly in the 1960s and 1970s, not anymore
- Preliminary Australian evidence (since 1995) indicates that insider purchasers outperform the market

- Analysts recommendations such as in the “Heard on the Street” column of the Wall Street Journal have a significant effect on stock prices on the day they appear
  - Analysts “sell” recommendations contain more information

- Professional money managers at mutual funds, pension funds, etc. are not able to match the performance of a simple buy and hold policy after transactions costs

Implications of Market Efficiency

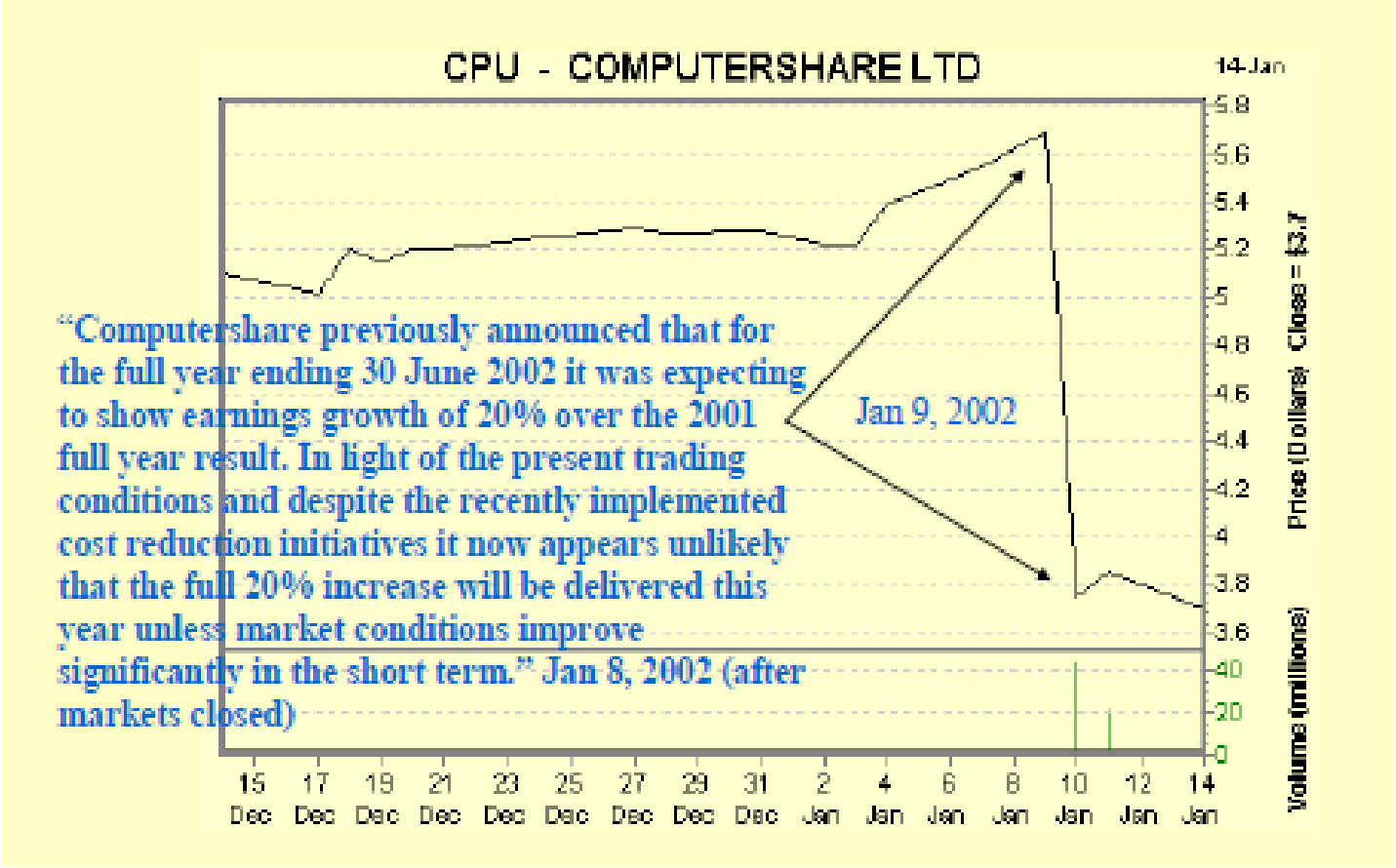
- In an efficient market any financial asset's NPV is zero
  - NPV = PV(Cash inflows) - PV(Cash outflows)
  - So, NPV = PV(Cash inflows) - Price = 0
  - So, Price or Value = PV(Cash inflows)

- Assets are priced appropriately for their market risk

- Security prices react virtually instantaneously to any new information and reach a new equilibrium before investors can exploit that information for abnormal profit/return
  - This does not imply that individual investors can never make abnormal profits

- Market efficiency implies that the profits cannot be made consistently after we take into account the cost of gathering and analyzing information

Information and Prices – An Example



Key Concepts

- Assets are priced appropriately for their market risk

- Security prices react virtually instantaneously to any new information and reach a new equilibrium before investors can exploit that information for abnormal profit/return

- Markets generally efficient with respect to past and public information. Not always with respect to insider information

- This does not imply that individual investors can never make abnormal profits

- Market efficiency implies that the profits cannot be made consistently after we take into account the cost of gathering and analyzing information

- In an efficient market any financial asset's NPV is zero

Fundamental versus Technical Analysis

- *Fundamental Analysis*: involves analysing its income statements, financial statements, its management and competitive advantages and its competitors and markets
    - The analysis is performed on historical and present data, but with the goal to make financial projections

- *Technical analysis*: the study of market action, primarily through the use of charts, for the purpose of forecasting future price trends
    - Academics such as *Eugene Fama* say the evidence for technical analysis is sparse and is refuted by the efficient market hypothesis

Fundamental and Technical Analysis

Fundamental Analysts

- Research the value of stocks using NPV and other measurements of cash flow.

Technical Analysts

- Forecast stock prices based on the watching of the fluctuations in historical prices

Behavioral Finance

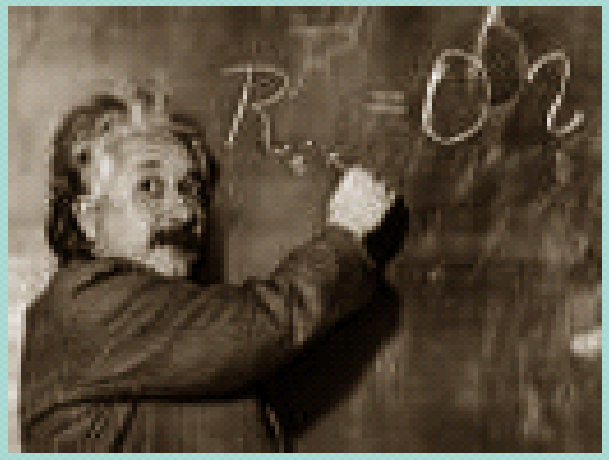
Argues that market participants suffer from systematic psychological biases that result in sub-optimal decisions

Investors underreact to new information that contradicts prior beliefs (e.g., dramatic change in earnings).

Investors overreact to a string of similar information (e.g., investors expect recent trends to continue).

Investors are overly confident in their ability to identify misvalued stocks.

“Is Behavioural Finance Inconsistent with Efficient Market Hypothesis”



Homo economicus

- The investor is often assumed **rational:**
  - Investor can consistently rank all investments based on expected return and risk.
  - Investors use the correct model to value shares:
    - Uses discounted cash flows
    - Uses all information
    - Knows how to analyze the information
  - Investors know how to form portfolio etc
  - In short investors have at least a Masters in Finance.

Rational expectations

Summary:

Homo economicus mazimizes utility over **expected** return and risk.

How does Homo economicus form expectations:

Rational expectations:

- Investors do not make systematic mistakes.
- Investors use all available information to form the forecasts
- They know and use the true model to form the forecasts.

$$\text{Actual or true price}_{t+1} = \text{Expected Price}_{t+1} + \text{random error}_{t+1}$$

Academics and the efficient market hypothesis

Michael Jensen (Journal of Financial Economics, 1978)

"..there is no other proposition in economics which has more solid empirical evidence supporting it than the Efficient Market Hypothesis"

Michael Jensen
Nobelprice ?

Academics and the efficient market hypothesis

Wall Street Journal (18/10-2004):

"Robert Shiller, a Yale University economist, has long argued that efficient-market theorists made one huge mistake: Just because markets are unpredictable doesn't mean they are efficient. The leap in logic, he wrote in the 1980s, was one of "the most remarkable errors in the history of economic thought."

Robert Shiller

Conclusions

- EFH contradicts technical analysis
- Prices follow a random walk with a drift
- Behavioural finance is inconsistent with EFH
- The two paradigms remains