

15.433 INVESTMENTS  
Class 22: Market Efficiency

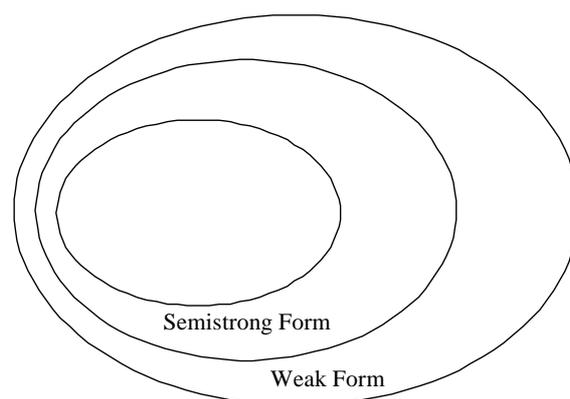
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# Types of Market Efficiency

**The Weak Form** of Efficiency: Prices accurately reflect all information that can be derived by examining market trading data such as past prices, trading volume, short interest, etc.

**The Semi-strong Form** of Efficiency: Prices accurately reflect all public available information, including past prices, fundamental data on the firm's product line, quality of management, balance sheet composition, patents held, accounting practices, earning forecasts, etc.

**The Strong Form** of Efficiency: Prices accurately reflect all information that is known by any one, including inside information.



*Figure 1: Return distribution of US 10 Year Bond*

An inefficiency ought to be an exploitable opportunity. If there is nothing investors can properly exploit in a systematic way, time in and time out, then it's very hard to say that information is not being properly incorporated into stock prices".

*Richard Roll*

Financial markets are efficient because they don't allow investors to earn above average returns without taking above average risks".

*Burton Malkiel*

The efficient markets theory holds that the trading by investors in a free and competitive market drives security prices to their true 'fundamental' values. The market can better assess what a stock or a bond is worth than any individual trader."

*Andrei Shleifer*

# Information Arrivals and Price Updates

The efficient market theory states that security prices reflect all currently available information.

One interesting empirical question is: how does the market adjust to the arrival of new information?

Event study methodology is one such tool to measure the economic impact of events.

# Paths to Efficient Prices

How does information get impounded in prices?

If gathering information is costly, can prices still perfectly reflect information?

If market prices deviate from their fundamental values, what brings them back?

How do prices deviate from their fundamental values in the first place?

# Limits of Arbitrage

Arbitrage plays a critical role in the analysis of securities markets, because its effect is to bring prices to fundamental values and to keep market efficient.

The textbook example assumes that the arbitrageur has access to infinite amount of capital.

In practice, the arbitrageurs are capital constrained, and their effectiveness in bringing prices to fundamental values is limited. Mutual

# Fund Performance

Equity funds: on average, active managers underperform index funds when both are measured after expenses, and those that do outperform in one period are not typically the ones who outperform in the next.

Fixed Income funds: on average, bond funds underperform passive fixed income indexes by an amount roughly equal to expense, and there is no evidence that past performance can predict future performance. Peter Lynch and Magellan Fund Let  $r_t$  be the monthly returns of Magellan Fund:

$$r_t - r_{f,t} = \alpha + \beta(r_{M,t} - r_{f,t}) + sr_{smb,t} + hr_{hml,t} + \varepsilon_t \quad (1)$$

	Overall Period 76/6-98/12	Peter Lynch 76/6-90/5	Post-Lynch 90/6-98/12
$\alpha$	0.51 (0.11)	0.75 (0.13)	0.07 (0.14)
$\beta$	1.12 (0.03)	1.13 (0.03)	1.04 (0.04)
$s$	0.34 (0.04)	0.55 (0.05)	0.05 (0.05)
$h$	0.02 (0.05)	-0.01 (0.06)	0.00 (0.06)
$R^2$	0.91	0.94	0.90

# Anomalies?

The size effect

The value effect

The short term momentum

The long term reversal

The new issues puzzle

The weekend/holiday effect

The January effect

# The Bottom Line

The efficient market hypothesis is a useful framework for modelling financial markets.

Like any model, the 'efficient market hypothesis is not a perfect description of reality; some prices are almost certainly "wrong".

However, it would be naive to think that prices are always wrong or that it is easy to exploit pricing errors. " Instead of asking whether or not the market is efficient, the more relevant questions are:

- how efficient is the market?
- how does the market react to new information arrivals? and why?
- what are the mechanisms that bring market prices to fundamental values?

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**Focus:**

BKM Chapter 12

- p. 343-368 (12.2,12.4)

type of potential questions: Concept check questions, p. 375 ff. question 4,5,7,8,16,17,21

- Rubinstein: Rational markets vs. rational investors, anomalies (pp. 18, 20-21,23-26)
  - Fama: critical review of model setup for testing EMH (time, return, bias etc.)
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# Questions for Next Class

Please read:

- BKM Chapters 17-19
- Business Week (2001),
- Wall Street Analysts: Who Needs 'Em?" (The New Yorker)