



Lecture 9

Efficient Capital Market

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Price Fluctuation

- Tesla's stock price increases by 14% after Trump wins the presidential campaign. Why?



Financing decision and firm value

- In prior lectures, we show how investment decisions create value for a firm: by selecting positive NPV projects.
- How about financing decisions? Recall that financial decisions affect WACC and thus affect the discount rate in the NPV calculation.
- A firm may reduce its cost of capital in three ways:
 - Fool investors: raise capital at higher-than-fair prices. If it happens, why investors are so stupid persistently?
 - Reduce financing costs: Certain forms of financing have tax advantages or carry other subsidies.
 - Create a new security: satisfy the demand of certain group of investors and they would be willing to pay a higher price.

Timing of raising capital



When should a firm issue new stocks, at point A or B?

高卖：用少如股扣稀释去筹集资金。

Information and Price

- Recall the stock valuation methods: DDM, DCF. Take DCF for example,

$$P_0 = \frac{\text{Cash Flow}_1}{(1 + R)^1} + \frac{\text{Cash Flow}_2}{(1 + R)^2} + \frac{\text{Cash Flow}_3}{(1 + R)^3} + \dots$$

- The cash flows here are expected cash flows, which are investors' personal prediction.
 - Different people have different predictions
 - They changes with new information arrival.
- This is why stock price responds to immediate news.

Efficient Market Hypothesis



- Efficient market hypothesis (EMH, 有效市场假说): An *efficient* capital market is one in which stock prices fully reflect available information.
- The EMH has implications for investors and firms.
 - Since information is reflected in security prices quickly, knowing information when it is released does an investor little good.
 - Firms should expect to receive the fair value for securities that they sell. Firms cannot profit from fooling investors in an efficient market.
 - 股市是经济的晴雨表

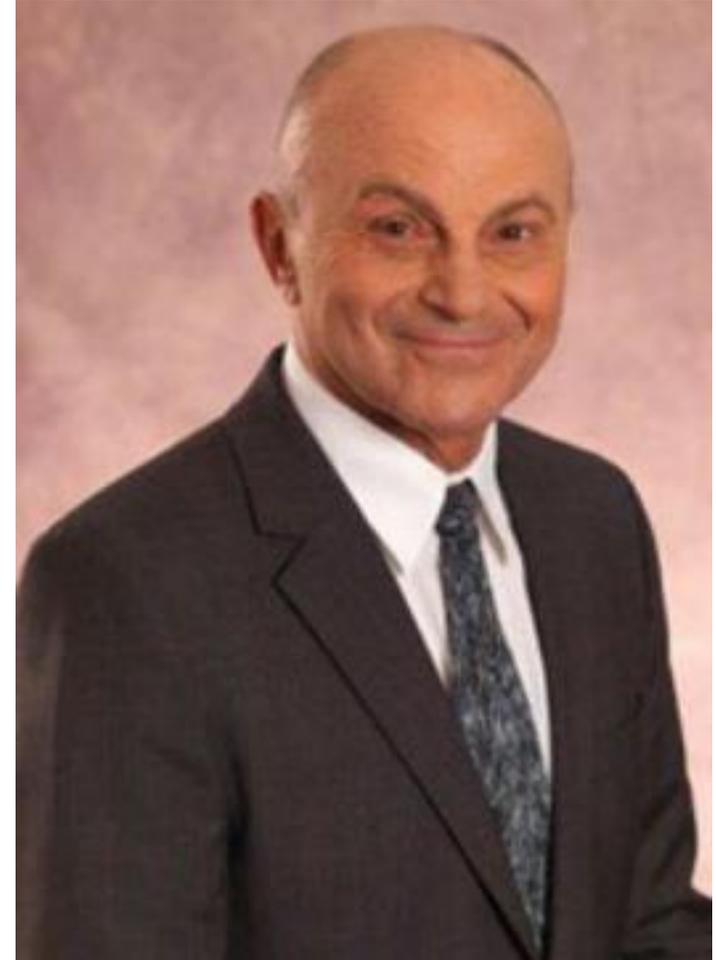
Who innovate the EMH?

Eugene Fama

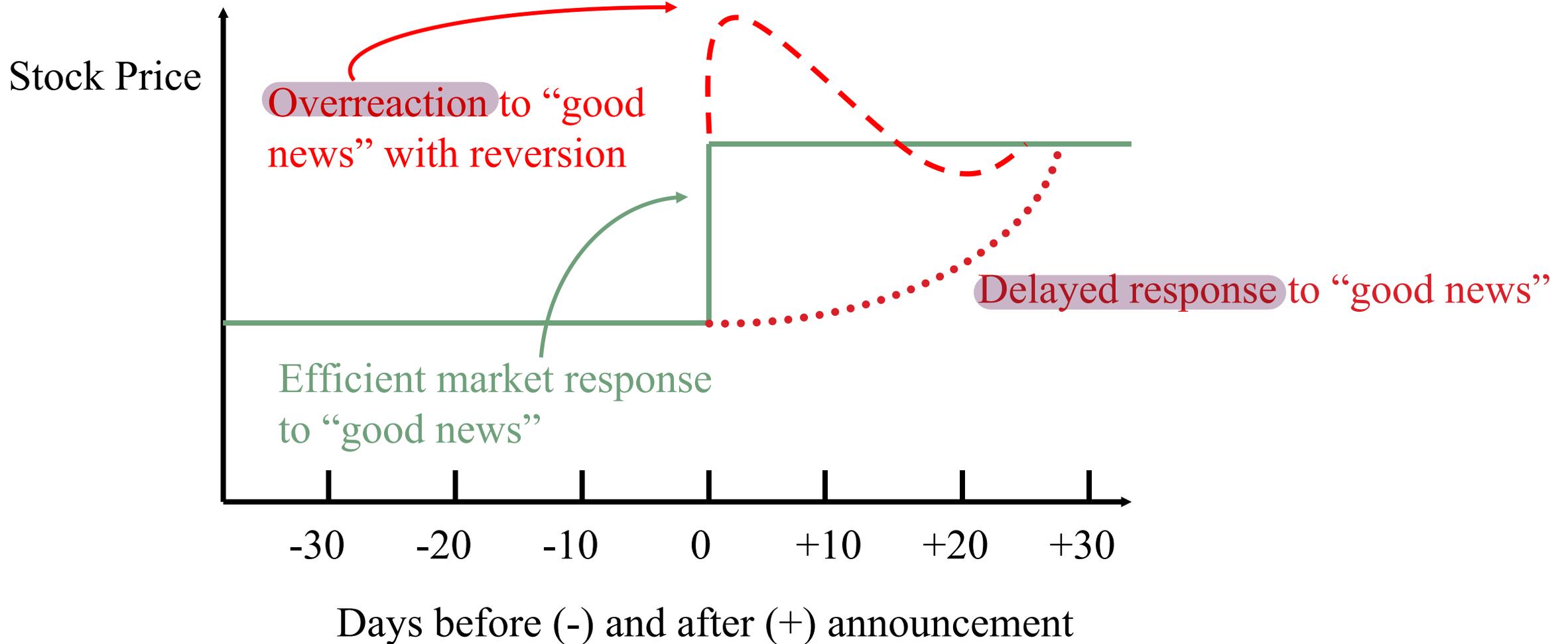
Professor of Finance

Chicago Booth Business School

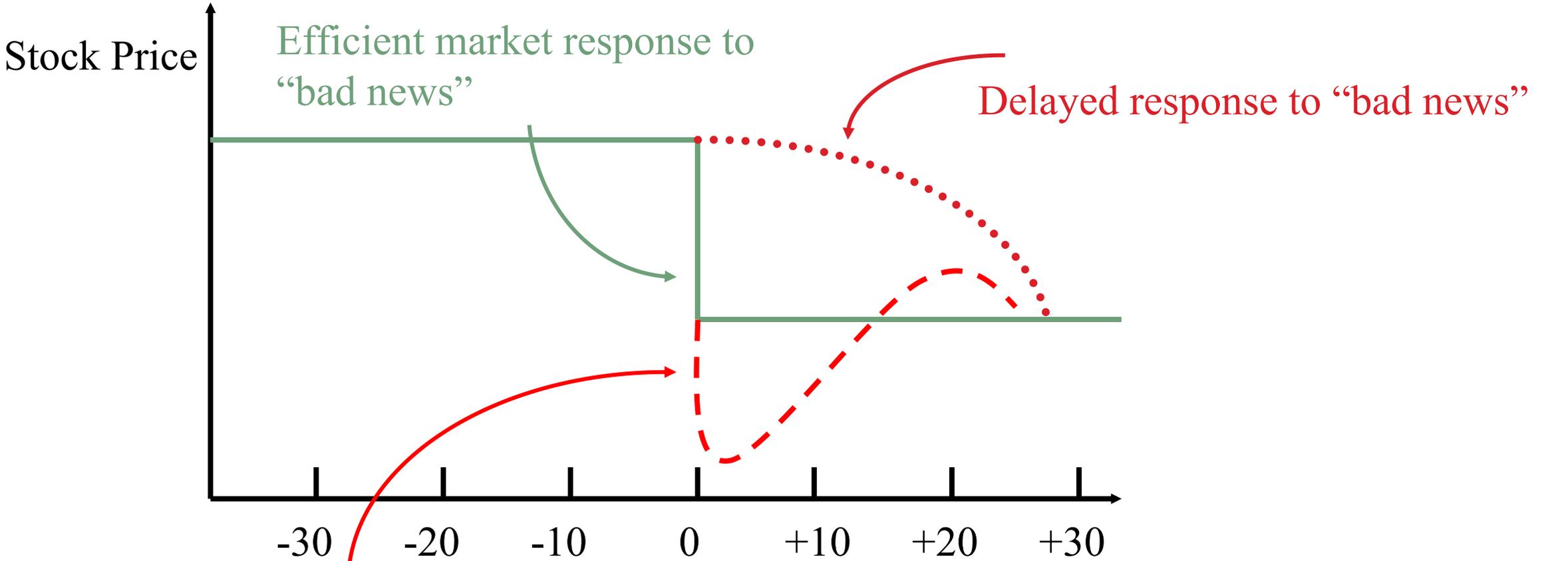
He won 2013 Nobel laureate in economic sciences for his efficient market theory.



Market reaction to good news



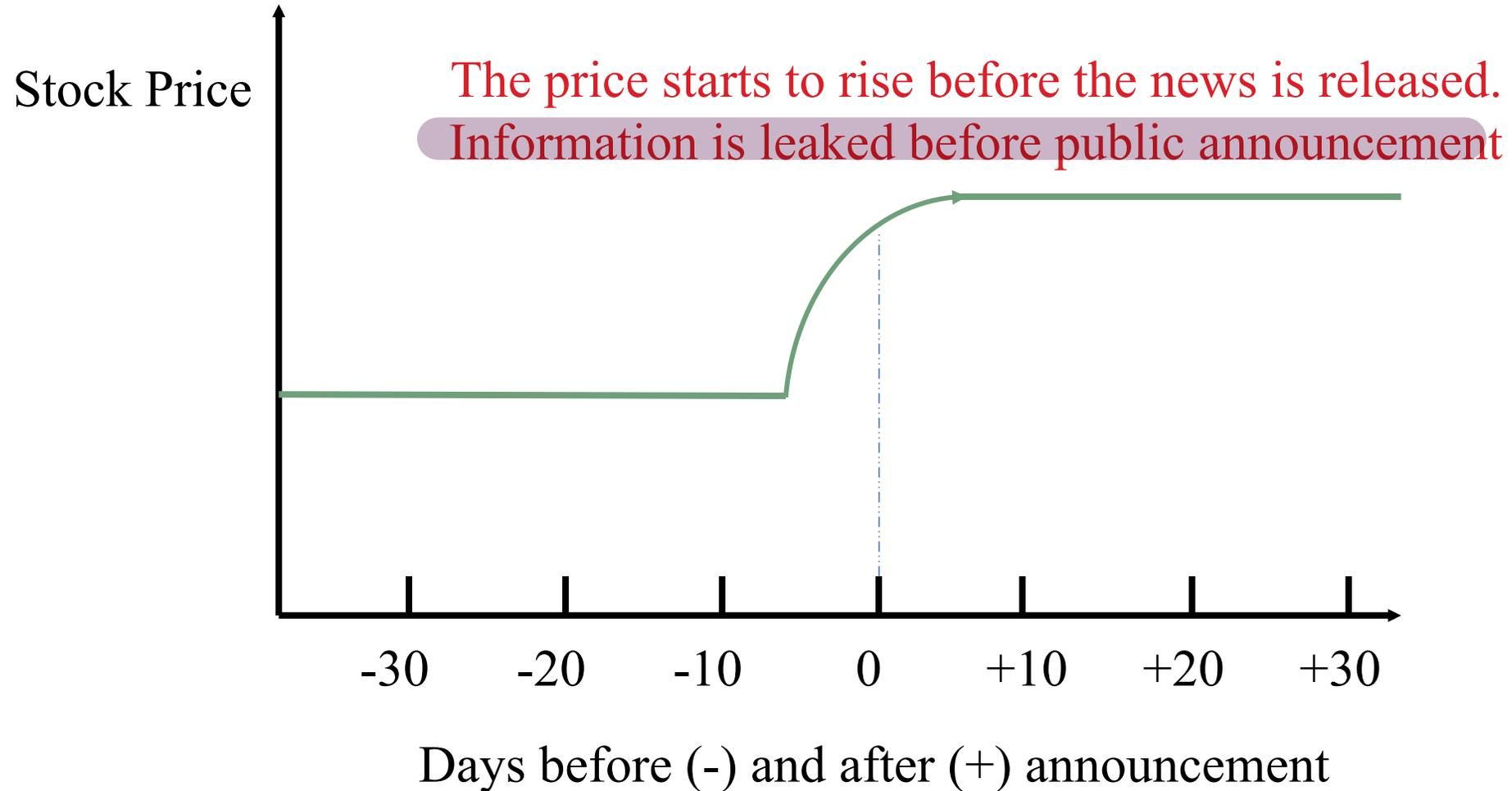
Market reaction to bad news



Overreaction to “bad news” with reversion

Days before (-) and after (+) announcement

Evidence of inside trading (内幕交易)



News type: Good or Bad(利好还是利空)

Rule: Check how the information affects cash flows or discount rate.

● Macro-wide news

- Israel declare war against Palestine (-).
- Biden wins the presidential election (?).
- The central bank announces a cut on the benchmark interest rate (+).

● Industry-wide news

- 国家发改委宣布逐渐削减对新能源汽车的补贴 (-).
- 中国政府宣布大力发展芯片行业(+).

● Firm-wide news

- Earning surprise: the real earnings beat analysts' forecasts (+).
- The Apple company states that it seek to acquire Tesla (?).

Surprise news

- Good vs. bad news: good news positively affect investors' *expectation* on firm's future cash flows, which positively affect stock price according to the DCF model
- Not all the news will cause significant stock market reaction. **Stock price only reacts to surprise news.** The reason is investors already form expectations on a firm's future prospects. They value a firm based on this belief. For example:
 - The analysts forecasts the earning of a firm in next year is RMB10,000. Only when the earning is higher than the forecast, the stock price will go up.
 - When the actual earning fail to beat the forecasts, the price will react negatively even though the earning of the firm experiences a large increase relative to last year.

Types of market efficiency



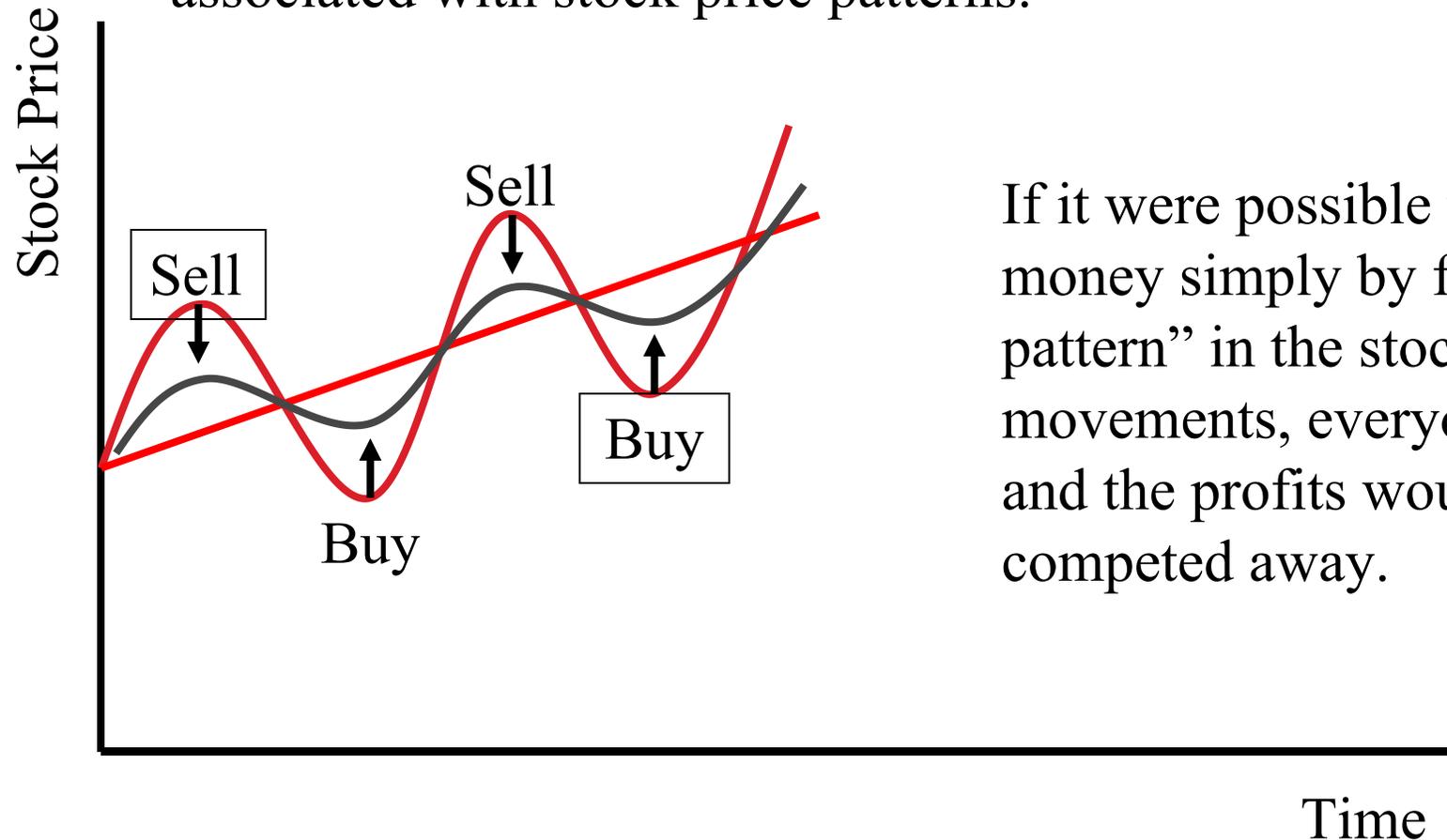
- **Weak form:** Security prices reflect all **historical** information.
 - Technical analysis is not profitable
- **Semi-strong form:** Security prices reflect all **publicly** available information.
 - Forecast based on public information is not profitable.
- **Strong Form:** Security prices reflect all public and **private** information.
 - Trading based on inside information is not profitable.

Weak form market efficiency

- Security prices reflect all information found in past prices and volume.
- If the weak form of market efficiency holds, then technical analysis is of no value.
 - ▣ Technical analysis (技术分析) predict stock price based on its past price and trading volume.
- Since stock prices only respond to *new* information, which by definition arrives randomly, stock prices are said to follow a random walk(随机游走).

Why technical analysis fails?

Investor behavior tends to eliminate any profit opportunity associated with stock price patterns.



If it were possible to make big money simply by finding “the pattern” in the stock price movements, everyone would do it, and the profits would be competed away.

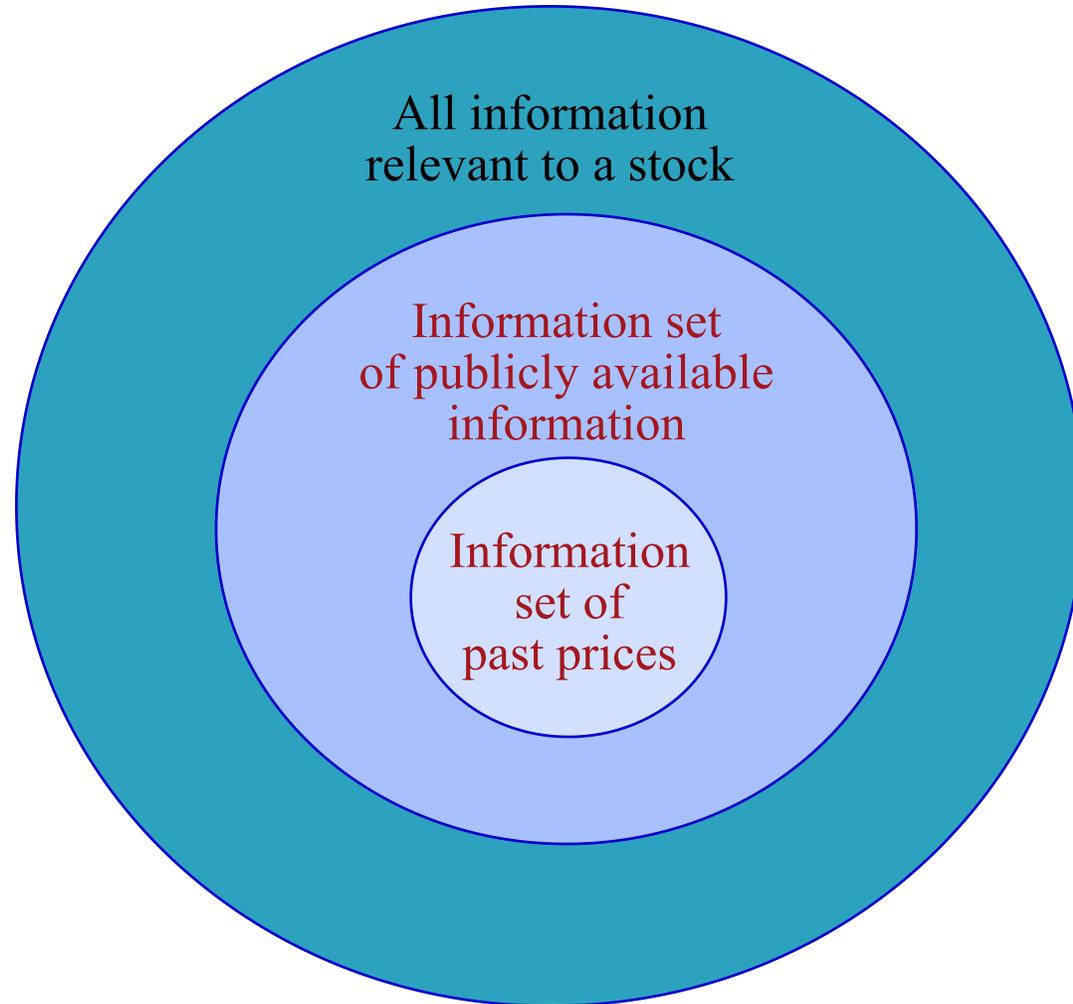
Semi-strong form market efficiency

- Security prices reflect all publicly available information.
- Publicly available information includes:
 - Historical price and volume information
 - Published accounting statements
 - Information found in annual report
- Inside trading can make profits: Trade based on **nonpublic** and **material** information is illegal.

Strong form market efficiency

- Security prices reflect all information—public and private.
- Even an insider cannot profit from his private information. As soon as the insider tried to trade on his information, the market would recognize what was happening, and the market would shoot up before his action.
- Strong form efficiency incorporates weak and semi-strong form efficiency.
- Strong form efficiency says that *anything* pertinent to the stock and known to at least one investor is already incorporated into the security's price.

Information Set



Evidence support the EMH

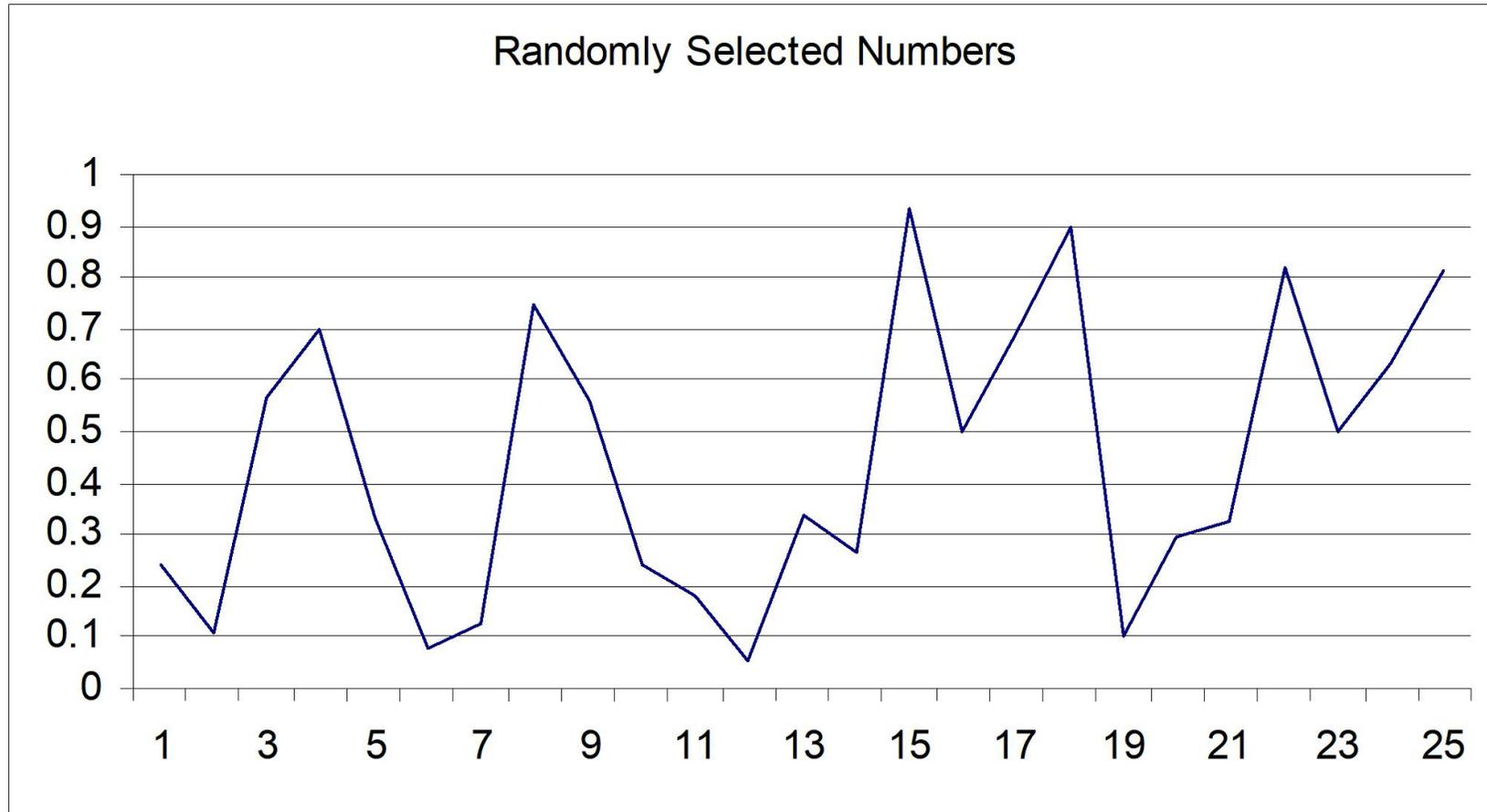
- Weak form
 - Are changes in stock prices random? Are there profitable “trading rules?”
- Semi-strong form
 - Event studies: does the market quickly and accurately respond to new information?
 - The record of professionally managed investment firms.
- Strong form: Not supported
 - Insider trading are profitable in the real world.

Quick question: which form of EMH does Chinese stock market satisfy?

Are stock price random?

- Prices reflect information. The price change is driven by *new* information, which by definition arrives randomly.
- Therefore, financial managers cannot “time” stock and bond sales.
- Randomness suggest there is no obvious pattern in stock price. People claiming to see patterns in stock price movements are probably seeing optical illusions.
- Random stock price changes support weak form efficiency.

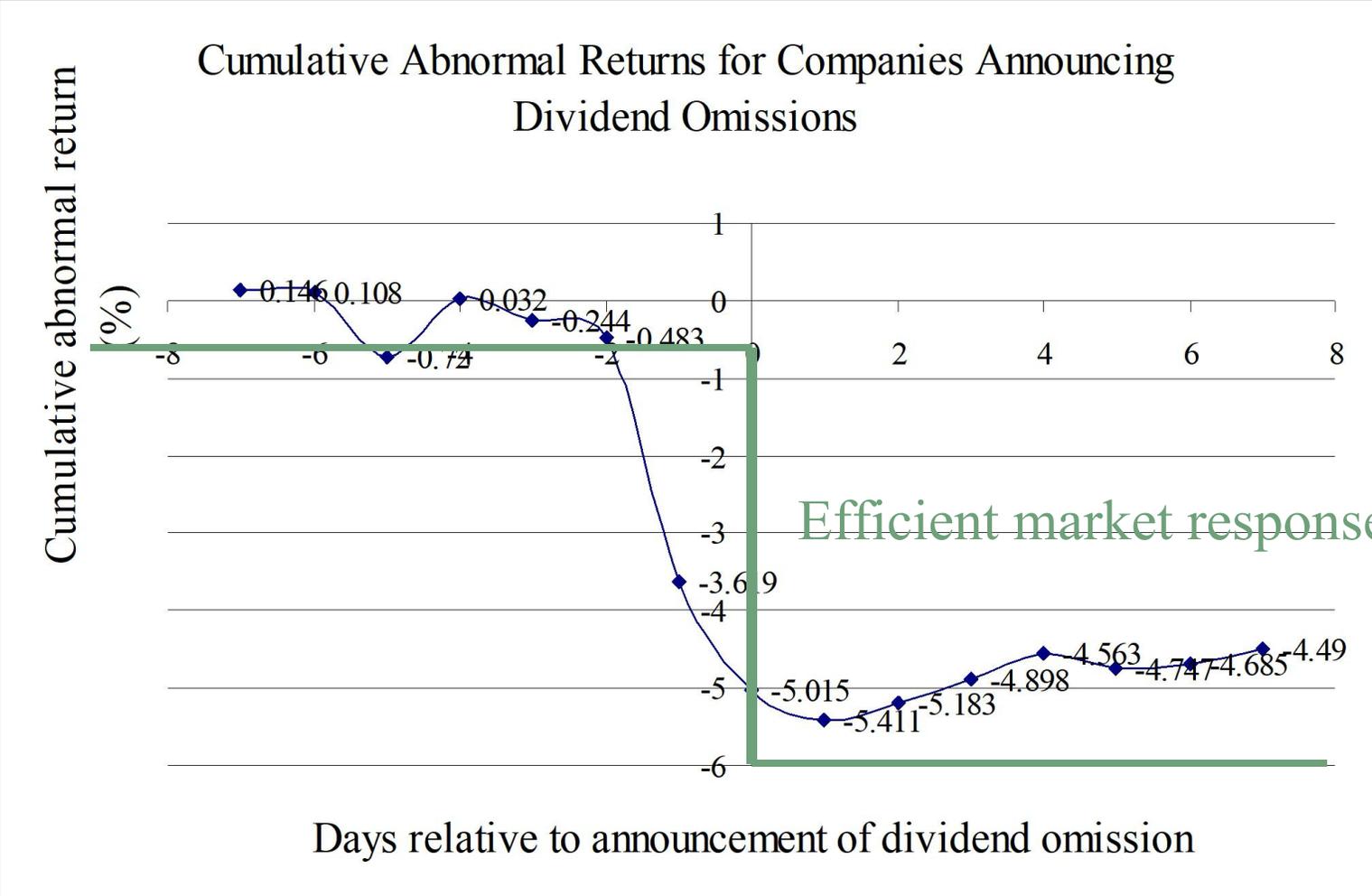
Random Process



Event study (事件研究法)

- Event Study: how stock price reacts to events, such as
 - Earnings announcements
 - Mergers
 - New issues of stock
- Event Studies are one type of test of the semi-strong form of market efficiency.
 - Recall, this form of the EMH implies that prices should reflect all publicly available information.
- Test for evidence of under-reaction, overreaction, early reaction, or delayed reaction around the event.

Event Studies: Dividend Omissions



Efficient market response to “bad news”

Event Study

- Over the years, event study methodology has been applied to a large number of events including:
 - Dividend increases and decreases
 - Earnings announcements
 - Mergers
 - Capital Spending
 - New Issues of Stock
- The studies generally support the view that the US stock market is semi-strong form efficient.
- Studies suggest that markets may even have some foresight into the future, i.e., news tends to leak out in advance of public announcements.

The record of mutual funds

- Fund type:
 - **Passive fund (被动基金)**: track market index and buy their constituents, e.g. 沪深300, 上证1000.
 - **Active fund (主动基金)**: fund managers actively conduct research and select stocks to outperform the market.
- If the market is semi-strong form efficient, then no matter what publicly available information mutual fund managers rely on to pick stocks, their average returns should be the same as those of the average investor in the market as a whole.
- We can test efficiency by comparing the performance of active funds with passive fund.

The strong form of the EMH

- One group of studies of strong form market efficiency investigates **insider trading**.
- A number of studies support the view that insider trading is abnormally profitable.
- Thus, strong form efficiency does not seem to be substantiated by the evidence.

Behavioral Finance

- Traditional finance theories assume the behaviors of investors are rational. However, it is not always the case. Humans are not robots and have emotion and sentiment.
- Since traditional theories cannot explain many phenomenon in financial market, scholars propose new explanations from behavior's perspective.
- Behavior finance (行为金融学): an interdiscipline between psychology and finance. Investors and managers are not always rational and have many psychological limits, which can affect their investment decisions.

Types of behavior bias



● Types of behavior bias:

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- ❑ Herding (羊群效应): buy when others buy. Sell when others sell. 追涨杀跌.
- ❑ Overconfidence: too confidence about the company they buy.
- ❑ Disposition effect (处置效应) : Hold on to losers but sell winners.
- ❑ Familiarity: buy stock that you are familiar with. 买自己公司的股票
- ❑ Representativeness (overreaction): drawing conclusions from too little data
- ❑ Conservatism (underreaction): people are too slow in adjusting their beliefs to new information.

Challenges to EMH

- Limits to arbitrage
 - Short selling restriction compromises market efficiency
- Earnings surprises
 - Stock prices adjust slowly to earnings announcements.
 - Behavioralists claim that investors exhibit *conservatism*.
- Value versus growth stock
 - Low-PE stocks outperform high-PE stocks.
- Crashes and Bubbles
 - High-tech bubble and Chinese stock market crash in 2015
 - Herding behavior explanation

Implications for corporate finance

- If information is reflected in security prices quickly, investors should only expect to obtain a normal rate of return.
- Firms should expect to receive the fair value for securities that they sell and cannot fool investors in efficient markets. The discount rate, expected rate, and required return should be the same.
- Managers can learn from the market.
 - If the stock price increases after the sudden death of the CEO, what does it mean?
 - If Company A announces to acquire Company B, the price of company A drops, how can we perceive this?
 - When Trump wins the presidential election, the stock market increase, what can we tell?