

# **Efficient Market Hypothesis (EMH) and Insider Trading**

# Introduction

- According to the traditional finance, markets are “*rational*”; that is, they are efficient in the sense to reflect the current prices supporting the *Efficient Market Hypothesis (EMH)*.
- In contrast, behavioral finance argues about this kind of market rationality with the observed *market anomalies* that are not explained by the arguments of the EMH.
- Many researchers including DeBondt and Thaler (1985), Black (1986), De Long et al. (1990), Shieifer and Vishny (1995), Thaler (1987, 1999) etc. revealed many observed market anomalies.
- However, despite many observed market anomalies, the EMH is still the *dominant paradigm* in order to organize and rule the markets.

# EMH-Historical Development

- The *roots of the EMH* can be traced back to the pioneering theoretical contribution of *Louis Bachelier (1900)*. He worked on stock and commodity prices in order to find out if they fluctuated randomly or not.
- In 1905 Kark Pearson introduced random-walk, also known as the drunkard walk concept (*Dimson et al., 1998:91-92*).
- Unfortunately, Bachelier's first attempt showing the difficulty to outguess the market and the random characteristics of the prices and also Pearson's random-walk concept was ignored or at least no further study had come until 1930s.

# EMH-Historical Development Conti...

- ***Cowles (1933)*** presented the results of analysis of the forecasting efforts of some professional agencies including insurance companies, investment companies, and financial publications which have attempted to predict which specific securities would be most profitable and the future movements of the stock market itself. He found that these professional agencies have no obvious skills to beat the market.
- ***Kendall (1953)*** who for the first time used term random-walk in finance literature, examined 22 British Stock Indexes and American commodity prices in order to find out regular price cycles.
- He found that prices seemed to follow a random-walk; they may go up or go down on any particular day, regardless of what had occurred on the previous day.

# EMH-Fama's Discussion

- *Fama (1965a)* discussed some empirical evidence supporting random-walk theory in his doctoral dissertation. He positioned random-walk theory which has appeared in academic journals, but has not been appreciated in later years, against the technical and fundamental analysis which is too complicated for the non-mathematicians.
- As he declares, the logic behind the *technical (chartist)* theories is that history tends to repeat itself. That is, if we look at the past behavior of an individual security or a stock market itself, we can foresee their future path by analyzing past sequence of price changes.
- According to him, it is impossible to gain *abnormal profit* by looking at the history of the price change series because successive price changes are independent (chartist theories say dependent), exactly what random walk theory says.

# EMH-Fama's Discussion Conti...

- Moreover, he thought that the market professionals rely on the fundamental analysis rather than technical analysis.
- The assumption of the fundamental analysis approach depends on the belief that security has an intrinsic value other than actual price.
- Intrinsic value is the value of a security's potential earnings.
- Some fundamental factors such as quality of management, the overall situation of the industry in which the firm operates and the economic condition itself can affect a security's potential earnings.
- Therefore, an analyst can predict the future price of a security by evaluating these fundamental factors by finding out the intrinsic value and comparing it with the security price.

# Definition-EMH

- Fama (1970) presented a landmark paper on the efficient market which focused on comprehensive review of the theory and beyond the theory to empirical work.
- He defines market efficiency very clearly (Fama, 1970:383):

“A market in which prices always fully reflect all available information is called efficient”.

- According to the definition of the EMH, an efficient market can exist if the following conditions hold:
  - (1) All investors have costless access to currently available information about the future;
  - (2) All investors are capable analysts, and
  - (3) All investors pay close attentions to market prices and adjust their holdings approximately.

# Forms of Market Efficiency

- In an efficient market a set of information is fully and immediately reflected in market prices. A popular distinction, offered by Eugene Fama, is the following:

Forms of Efficiency	Set of Information Reflected in Security Prices
Weak	Previous prices of securities
Semi-strong	All publicly available information
Strong	All information, both public and private

- This distinction leads to an equivalent definition of an efficient market as follows:

*“A market is efficient with respect to a particular set of information if it is impossible to make abnormal profits (other than by chance) by using this set of information to formulate buying and selling decisions”.*



# Forms of Market Efficiency Conti...

- In his original article, Fama divided the overall efficient market hypothesis (EMH) into three sub-hypotheses depending on the information set involved: (1) weak-form efficiency, (2) Semi strong-form efficiency, and (3) Strong-form efficiency.
- An efficient capital market is one in which security prices adjust to the arrival of new information and, therefore the current prices of securities reflect all information about the security.
- In an efficient market investors should expect to make only normal profits by earning a normal rate of return on their investments.

# (1) Weak-form efficiency

- A market would be described as being weak-form efficient if no investor can earn excess returns (abnormal returns) by developing trading rules based on *historical price or return information*.
- It also implies that all historical information is fully reflected in the actual asset price.
- That is it follows a *random walk*, which means that that market prices follow a random path up and down, without any influence by historical price movements.
- Investors who believe in the *random walk theory* feel that it is impossible to outperform the market without taking an additional risk, and also believe that neither *fundamental analysis* nor *technical analysis* have any validity.

## (2) Semistrong-form efficiency

- A market would be described as being semistrong-form efficient if no investor can earn excess returns (abnormal returns) from trading rules based on *any publicly available information* such as annual reports and financial statements of companies, reports in the financial press, and historical data.
- It implies that all publicly available information is fully reflected in the *actual asset price*.
- With semistrong efficiency, the market's reaction to new relevant information should be instantaneous and unbiased, without any systematic pattern of under or over reaction.

### (3) Strong form efficiency

- A market would be described as being strong form efficient if no investor can earn excess returns using any information, whether *publicly available or private information*.
- It implies that all information is fully reflected in the actual asset price.
- *The strong form efficiency is very strong indeed!* It means that corporate insiders can not make profit using private information.
- *For example*, suppose that our company has just made an important technological discovery. It means that prices will have adjusted (so that no profit) before we even had a chance to trade upon the news.

### (3) Strong form efficiency Conti...

H: the set that includes the history of prices or returns.

P: the set that includes publicly available information.

A: the set that includes all available information (private and public)

$H \subset P \subset A$ : H is a subset of P, which is a subset of A

- All three forms of efficiency imply that investors, trading on the respective information set, should be unable to realize average excess returns above the 'normal rate'.
- The normal rate or return is typically the rate of return justified by an (equilibrium) asset pricing model, such as the CAPM, APT, three-factor models, etc.
- If the abnormal return is not forecastable (and in this sense 'random') conditional on the chosen information set, then EMH is not rejected.

# Figure 1: Information and the levels of market efficiency

**Strong-form: All Public and Private Information [A]**

**Semistrong-form: All Public Information [P]**

**Weak-form: Past Prices [H]**

- Figure-1 exhibits these three forms of market efficiency.
- If markets are strong-form efficient, then they are also semistrong and weak form efficient.
- Similarly, if markets are semistrong-form efficient, then they are also weak-form efficient.

# EVIDENCE AGAINST MARKET EFFICIENCY

- Small-Firm Effect
- Large cap & small cap and book to market value effect
- January effect
- Week end effect
- Excessive volatility
- New information is not always reflected in stock price
- Market overreaction to news announcements



- Next 20 slides are from the presentation of different officials of US Securities and Exchange Commission (SEC)

# SEC Enforcement: FY 2014

755 total cases v. 1561 defendants

- Investment Adviser/Company Violations: 130 (17%)
- Broker-dealer Violations: 166 (22%)
- Offering Frauds: 81 (11%) – Pyramid/ponzi schemes and boiler rooms
- Criminal Filings: 110 (15%)
- Issuer Reporting and Disclosure: 96 (13%)
- Foreign Corrupt Practices Act Cases: 7 (1%) – Bribery of government officials.
- Insider Trading: 52 (7%)
- Market manipulation: 63 (8%) (FY: 2013 50 cases with 116 defendants (7.4%))

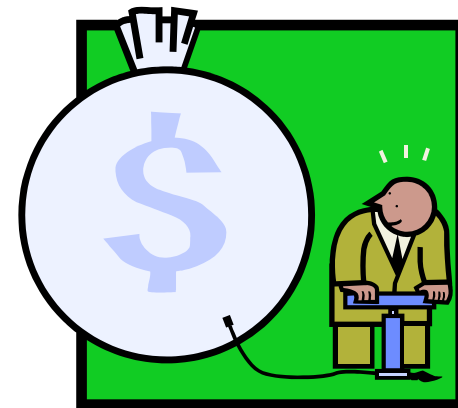
# Two Broad Types



- “Pump and dump” or “Hype and dump”
- Trading manipulations
- May see both types at work in a particular manipulation
  - For example, a combination of false press releases along with wash trades and matched orders

# “Pump and Dump”

- Insiders and promoters hype or promote the stock or company through a variety of fraudulent means to generate interest in the stock and cause the price to rise
  - False press releases
  - Paid promoters
  - E-mail spam campaigns
  - Fax blasts
  - Message board postings
  - Internet chat rooms
- Once stock hits a certain price level, insiders or promoters dump their stock on unsuspecting public and walk away with profits

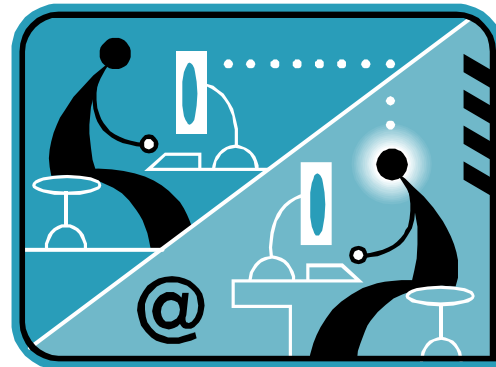


# Trading Manipulations

- Traders, brokers and others manipulate the market using various trading devices and/or the handling of quotations

- Examples:

- Wash Sales
- Matched Orders
- Marking the Close
- Dominated and Controlled Markets
- Arbitrary Quotations



# HARMAN TENDER OFFER

- In July 2009, Hazem Al-Braikan, a financial adviser based in Kuwait, drafted and issued a bogus press release claiming that a non-existent private investment group in Saudi Arabia planned to acquire Harman International through a tender offer. Al-Braikan fabricated the press release over the weekend of July 18-19, 2009, scouring the internet for an appropriate graphic logo for his fictional entity and preparing various drafts of the hoax release, which he then faxed or emailed to various news organizations in the U.S. and abroad. He also made dozens of calls to various media outlets in the U.S. and abroad in an attempt to convince them to pick up the story. On the morning of Monday, July 20, a U.S. Internet news website posted the false announcement, which claimed that an entity called "Arabian Peninsula Group" was planning to make a public tender offer for Harman stock at \$49.50 a share. At the time, Harman International's common stock was trading at about \$25 per share. The false announcement led to a pre-market trading surge that drove Harman International's stock up by nearly 40%. After Harman International repudiated the announcement an hour later, the company's share price dropped precipitously, closing the day at \$20.86, more than twenty percent lower than the prior trading day's close. Al-Braikan perpetrated a similar hoax using Textron Inc. in April 2009, contacting media outlets about an alleged "scoop" regarding an upcoming takeover bid for Textron by a Middle Eastern company. In actuality, no such deal existed.

# The Galleon Case



# The Beginning



- In October 2009, the FBI arrested Raj Rajaratnam, the billionaire founder of Galleon Group LLP, a New York based hedge fund advisory firm
- The SEC simultaneously filed civil charges
- *The biggest insider trading case in History*



# Who is he? (Courtesy of Wikipedia)

- Born in Sri Lanka in 1957
- Emigrated to England in 1971
- MBA from Wharton Business School (University of Pennsylvania)
- At the time of his arrest, Forbes rated him as 236th richest person in the U.S., with an estimated net worth of \$1.8 billion
- Started his career at Chase Manhattan Bank
- Joined the investment banking boutique of Needham & Co in 1985
- Started a hedge fund for Needham in 1992, which he later bought and renamed Galleon
  - Specialized in technology and healthcare stocks

# What else?

- Friends paint him as gregarious and generous, a fan of cricket and an avid player of fantasy football, a relatively straightforward man whose parents live with him and his wife, Asha, in Manhattan

([www.nytimes.com](http://www.nytimes.com))



# Origins of the Case

- In 2006 during an investigation of a hedge fund run by Rengan Rajaratnam, Mr. Rajaratnam's younger brother and a former Galleon employee, an SEC staffer discovered incriminating communications between the brothers
- However, the SEC investigation could not pinpoint the confidential source or enough evidence to support civil charges
- The criminal investigation commenced in March 2007, and encountered similar problems:
  - The criminal authorities conducted a “classic insider-trading probe” for more than a year, but an exhaustive review of phone and trading records failed to capture explicit evidence that would sustain a criminal case
  - In March 2008, the criminal authorities obtained permission for wiretaps

([www.topics.nytimes.com](http://www.topics.nytimes.com))

# Also Charged...

- **Danielle Chiesi** — a portfolio manager at New Castle Funds LLC
- **Rajiv Goel** — a managing director at Intel Capital, an Intel subsidiary
- **Anil Kumar** — a director at McKinsey & Company
- **Mark Kurland** — a Senior Managing Director and General Partner at New Castle
- **Robert Moffat** — a senior vice president at IBM
- New Castle Funds LLC — a New York-based hedge fund



# SEC's Allegations

- The SEC's complaint alleges that Rajaratnam tapped into his network of friends and close business associates to obtain insider tips and confidential information about corporate earnings or takeover activity at several companies, including Google, Hilton and Sun Microsystems
- He then used the non-public information to illegally trade on behalf of Galleon

# How did he do it?

- How did Rajaratnam convince so many people to break the law?
  - Are public companies and their employees unaware of their legal obligations?
  - What kinds of policies and procedures should they have in place?
- What strategies might he have used?
- Would it be easy or hard to get people to reveal inside information?

# Contacts and Manipulation

- How did Rajaratnam convince so many people to break the law?
  - Colleagues marveled at the deep set of contacts he had cultivated inside Silicon Valley executive suites and on Wall Street trading floors
- Affinity Aspects:
  - Many of Rajaratnam's tipsters came from the South Asian immigrant community, a relatively small group of Indians, Pakistanis and Sri Lankans who over the past several decades have made their mark in finance and technology
  - He met several important sources of illegal information through the South Asian club at the Wharton business school at the University of Pennsylvania
  - He connected with another primary informant through his philanthropic support of the Indian School of Business, a prestigious graduate school in Hyderabad, India

([www.dealbook.nytimes.com](http://www.dealbook.nytimes.com))



# Creating the Obligation

- Kumar twice proposes to Rajaratnam that McKinsey work with his hedge fund, Galleon
  - Rajaratnam twice refused
- Later, Rajaratnam pulled him aside after a charity event and told him he didn't want to work with McKinsey, but he did want to retain Kumar. "I have one million in soft dollars that I can use to pay you for research. \$500,000 if you talk to me four to six times per year
- Kumar testified he felt like he had to give information to Rajaratnam because Rajaratnam was paying him

([www.businessinsider.com](http://www.businessinsider.com) and [articles.businessinsider.com](http://articles.businessinsider.com))

# More of the Same...

- Former Intel executive Goel testified he knew it was wrong to give the information to Raj, but did it anyway
  - Rajaratnam loaned him \$100,000 to buy a house, and later gave him \$500,000 when Goel's father became ill
- Goel gave Rajaratnam the information because Rajaratnam had "helped him out"

([articles.businessinsider.com](http://articles.businessinsider.com))

# Results from the 1<sup>st</sup> Wave

Defendant	Criminal Sentence and Forfeiture / Fine	SEC Disgorgement and Penalties
Raj Rajaratnam	11 years in prison and \$63.8 million	\$92.8 million
Danielle Chiesi	2 ½ years	\$540,535
Rajiv Goel	2 years probation and \$276,848	\$254,000 with additional penalties possible
Anil Kumar	2 years probation and \$2 million	\$2.8 million with additional penalties possible
Mark Kurland	27 months	\$4.4 million
Robert Moffat	6 months	Zero. Did not profit financially from the tipping Chiesi

# Evidence

- At Goffer's trial former Ropes & Gray attorney Brien Santarlas told jurors that he and Arthur Cutillo used prepaid mobile phones to pass on news about pending mergers in exchange for envelopes stuffed with cash
  - Goffer programmed two phones with numbers labeled "you" and "me" to communicate with a tippee
  - After using the phones, Goffer destroyed the tippee's phone by removing the SIM card, biting it, breaking the phone in half, throwing away half the phone, and instructing his tippee to get rid of the other half
- Taped conversations relied on
- Circumstantial evidence, such as records of calls in proximity to suspicious trading
- Testimony of cooperating witnesses

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