FINM3407 - Behavioural Finance

Challenges to Market Efficiency

Tutorial 3 Questions/Answers

Note: This topic has more questions than can be covered in a 2-hour session. The questions to be covered by your tutor are indicated by an asterisk (*); the rest questions should be viewed as extra practice problems.

In this tutorial, we are going to cover the following relevant topics: Efficient Market Hypothesis and Challenges to Market Efficiency.

There are a few references reading for these two relevant topics:

AckertDeaves Chapters 4

Investments, 12th Edition, By Zvi Bodie and Alex Kane and Alan Marcus Chapter 11/12

1. *Differentiate the following terms/concepts:

a. Momentum and reversal

With momentum we observe positive correlation in returns, whereas with reversal we observe negative correlation in returns.

b. Value and growth stocks

Stock prices for value stocks are low relative to accounting measures such as earnings, cash flow, or book value, whereas stock prices for growth (or glamour) stocks are high relative to earnings, cash flow, and book value, at least in part because the market anticipates high future growth.

c. Fundamental risk and noise-trader risk

Fundamental risk arises because of the potential for rational revaluation as new information arrives and noise-trader risk arises because mispricing can become more severe in the short run.

d. Carve-out and stub value

A carve-out is an offering of shares in a subsidiary company. Stub value is the implied stand-alone value of the parent company without the subsidiary.

2. ***Refer back to the set of exchange rates in the "Support 3 (from the textbook): There are no limits to arbitrage" section earlier in the chapter. Describe a profitable arbitrage strategy if x = 105.**

To illustrate how this works, in May 2008 the following three foreign exchange rates among dollars, euros, and yen were observed (x will be explained):

Currency pair	Rate
¥/€	159.3403
€/$	0.6455
¥/$	x

The trick is to go the correct direction around the triangle.

A bridge currency works in the following way. First convert dollars to euros at 0.6455, and then convert euros to yen at 159.3403.

*This indirect method yields 0.6455 * 159.3403 = ¥102.8543/$.*

Since $1 should only get you ¥102.85, take $1 and convert to ¥105. Then convert to €, ending up with 105/159.34=€0.6590. Then convert to dollars: .6590/.6455=$1.02 vs. the initial dollar.

3. ***Arbitrage is limited because the wealth of arbitrageurs is limited. Discuss this statement in the context of those who are managing their own money and those who are managing other people's money.**

When you are managing your own money, you are subject to fundamental risk and noise-trader risk. Plus such arbitrageurs will normally have a very limited pool of capital to use for arbitrage purposes. If you are managing other people's money, you will often now have more capital in your control. But you will be subject to a different sort of wealth control. Because they have the power to hire and fire, your horizon is of necessity short. In fact, many who are attempting to exploit arbitrage opportunities are subject to this reality. They are managing money for individuals (e.g., those pooling their money through mutual funds or hedge funds) or institutions (such as endowments), many of whom will not have a clear idea of the issues involved.

4. ***What is data snooping? What sort of empirical evidence is useful for obviating this critique?**

It is always possible to detect correlations in data merely due to randomness. Data snooping is the act of analyzing a dataset "to death" so as to detect such correlations, which are then termed "anomalies." To obviate this criticism, these correlations should exhibit consistency: they should hold over a number of periods, and perhaps in different countries as well.

5. *What are the three supports or (conditions) on which market efficiency rests? Why is it that only one of them is required?

The three supports are (1) investor rationality, (2) uncorrelated errors and (3) unlimited arbitrage. If the first holds, prices will be on average right and markets will be efficient. If the first does not hold, but the second does hold, while errors will be made, once again on average prices will be right. If the first two do not hold, but the third does hold, while prices have the potential to diverge from value because errors are often one-sided, arbitrageurs will notice such opportunities and swiftly take action so as to eliminate mispricing.

6. *Define market efficiency. What are the key assumptions of an efficient market hypothesis (EMH)?

Market efficiency is a situation where the prices of securities reflect all available information at any given time. The Efficient Market Hypothesis (EMH) assumes that all investors have costless access to currently available information about the future, they are rational, and they adjust their expectations instantly to reflect new information.

*Prices will react **instantaneously** and **without bias** to the release of information in such a way that **abnormal returns cannot consistently be made**.*

7. Discuss the different forms of market efficiency. How do they differ from one another?

There are three forms of EMH: weak, semi-strong, and strong. The weak form states that all past prices of a stock are reflected in today's stock price.

The semi-strong form suggests that all public information is calculated into a stock's current share price. The strong form implies that all information—public and private—is accounted for in a stock's current share price.

8. *Identify some of the main challenges to market efficiency. Give specific examples for each.

a. *Information asymmetry, where one party has more or better information than the other, creating an imbalance in the transaction. For example, a seller might know about an issue with a product that the buyer doesn't.*
b. *Behavioral biases like overconfidence or herd behavior can lead to irrational decisions, causing price distortions. For example, during the dotcom bubble, investors kept buying overpriced tech stocks, leading to a market crash.*
c. *Market manipulation, such as insider trading or price rigging, also pose challenges. The case of Enron is a notable example of market manipulation.*

9. *Discuss the concept of information asymmetry. How does it challenge market efficiency?

Information asymmetry occurs when one party has more or better information than the other. This can lead to market inefficiencies as the party with more information can exploit their knowledge to gain an unfair advantage. For example, insider trading, where trades are made based on non-public material information, directly challenges market efficiency.

10. *What role does irrational behavior play in challenging the Efficient Market Hypothesis?

Irrational behavior, as explained by behavioral finance, suggests that investors often behave irrationally, driven by cognitive biases rather than by objective information. This challenges the EMH as it contradicts the assumption of investor rationality. Examples of irrational behavior include overconfidence, anchoring, and herd behavior.

11. *What is meant by "behavioral finance"? How does it challenge traditional views on market efficiency?

Behavioral finance combines cognitive psychological theory with conventional economics and finance. It challenges the traditional views on market efficiency by introducing concepts of cognitive biases that can lead to irrational financial decisions, thus, market inefficiencies.

12. *Discuss the impact of market manipulation on market efficiency. Provide some real-life examples.

Market manipulation distorts prices and creates false trading volumes, undermining the integrity of financial markets. For instance, the 2010 "Flash Crash" in the United States was an example where high-frequency trading algorithms were blamed for causing a brief massive drop in the stock market.

13. *Analyze the role of high-frequency trading in challenging market efficiency.

High-frequency trading (HFT) uses complex algorithms to transact a large number of orders at very fast speeds. While some argue that HFT provides liquidity, others contend that it can cause market disruptions and create an uneven playing field, thus challenging market efficiency.

14. *In your opinion, are financial markets truly efficient? Support your position with evidence.

This answer will depend on personal views and may range from the belief in absolute market efficiency to the belief in various degrees of inefficiency. Evidence should be drawn from academic studies, historical market trends, or real-world market anomalies.

15. *Discuss the role of regulation in maintaining market efficiency. Can over-regulation pose a challenge to market efficiency?

- *Regulation helps to maintain market efficiency by ensuring fair trade, preventing market manipulation, and reducing information asymmetry. However, over-regulation*

can pose a challenge to market efficiency as it might stifle innovation and create barriers to entry, which may limit competition and create market distortions.

- **Arbitrage Opportunity:**
  - *Question: Suppose there is a stock that is priced at $100 per share on Exchange A and $102 per share on Exchange B. If a trader could simultaneously buy 100 shares from Exchange A and sell them on Exchange B, what would be the profit?*
  - *Answer: The trader could buy the stock for $100 per share on Exchange A and sell it for $102 per share on Exchange B. The potential profit would be the selling price minus the purchase price, multiplied by the number of shares. In this case, the profit would be ($102 - $100) * 100 = $200.*
- ***Insider Trading:**
  - *Question: An insider knows that a certain company's stock price, currently priced at $120 per share, will rise to $150 per share after an upcoming announcement. If the insider purchases 200 shares before the announcement and sells them immediately afterward, what would be the profit?*
  - Answer: The insider knows the stock price will rise to $150. If they buy 200 shares now at the current price of $120, they will spend $120 * 200 = $24,000. After the announcement, if they sell the shares at the new price, they will receive $150 * 200 = $30,000. Therefore, the profit from this insider trading would be $30,000 - $24,000 = $6,000.
- ***Market Bubbles:**
  - Question: A certain company's stock is currently priced at $50 per share. If the stock price grows at an annual rate of 20% for five years, what would the stock price be at the end of the fifth year?
  - *Answer: If the stock price grows at an annual rate of 20% for five years, you would use compound interest to calculate the future stock price. The formula for compound interest is P(1 + r/n)^(nt), where P is the principal amount (initial stock price), r is the annual interest rate (rate of growth), n is the number of times interest is compounded per year, and t is the time in years. If we assume that interest is compounded once per year (n=1), the calculation would be $50 * (1 + 20%/1)^(1*5) = $50 * (1.2)^5 = $124.74. So the stock price would be $124.74 at the end of the fifth year.*
- ***Efficient Market Hypothesis (Weak form):**
  - Question: Given the following stock prices over the last six months ($35, $37, $34, $36, $38, $37), and considering that the current price is $37, can future prices be predicted based on past prices?
  - Answer: The average stock price over the past six months can be calculated as ($35 + $37 + $34 + $36 + $38 + $37) / 6 = $36.17. Compared to the latest price of $37, there's not an obvious pattern discernible from these prices, suggesting that past prices do not seem to predict future prices. This is consistent with the weak form of the efficient market hypothesis, which states that all past market prices and data are fully reflected in securities prices, thus past prices cannot be used to predict future prices. However, it's important to

note that this does not rule out the possibility of markets being influenced by new information or future events.

16. *Question: Triangular arbitrage in foreign exchange markets

Consider the following exchange rates:

1 USD = 0.85 EUR (USD/EUR)

1 EUR = 130 JPY (EUR/JPY)

1 USD = 105 JPY (USD/JPY)

You start with 10,000 USD. Could you take advantage of a triangular arbitrage opportunity involving the Euro (EUR), the US dollar (USD), and the Japanese yen (JPY)? If yes, what would be your profit?

Hint: Please work out the synthetic cross rate between a currency pair and compare with the quoted prevailing exchange rate.

Answer:

Triangular arbitrage involves using a discrepancy between three foreign exchange rates to make a profit. In this case, you want to see if you can make a profit by changing USD to EUR, then EUR to JPY, and finally JPY back to USD.

Here are the steps to calculate the possible arbitrage:

a. Convert 10,000 USD to EUR: 10,000 USD * 0.85 EUR/USD = 8,500 EUR
b. Convert 8,500 EUR to JPY: 8,500 EUR * 130 JPY/EUR = 1,105,000 JPY
c. Convert 1,105,000 JPY back to USD: 1,105,000 JPY / 105 JPY/USD = 10,523.81 USD

So, if you started with 10,000 USD and after these transactions, you end up with 10,523.81 USD. This means there is indeed a triangular arbitrage opportunity, and you can make a profit of 10,523.81 - 10,000 = 523.81 USD.

17. *Match each example to one of the following behavioral characteristics.

	Example		Characteristic
a.	Investors are slow to update their beliefs when given new evidence.	i.	Disposition effect
b.	Investors are reluctant to bear losses caused by their unconventional decisions.	ii.	Representativeness bias
c.	Investors exhibit less risk tolerance in their retirement accounts versus their other stock accounts.	iii.	Regret avoidance
d.	Investors are reluctant to sell stocks with “paper” losses.	iv.	Conservatism bias
e.	Investors disregard sample size when forming views about the future from the past	v.	Mental accounting

Answer:

a. iv

b. iii

c. v

d. i

e. ii