**Homework**

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**Q 12.25.** What kind of evidence would heretics against market efficiency ideally want to muster? If they fail to find this kind of evidence, does it mean that you should conclude that markets are efficient?

Heretics have found assets that pay too much for their risk.

No. You should conclude that markets are efficient if the market has set the price correctly as if it were using all available information.

**Q 12.26.** Define “efficient market” and explain how it differs from a perfect market.

A market is an efficient market if the market has set the price correctly as if it were using all available information.

There would be taxes and transaction fees in efficient market but not in perfect market. In an efficient market, individuals may have different information or opinions. While in the perfect market, everyone should have the same opinions and same information.

**Q 12.27.** Peter Lynch, a famous former fund manager for Fidelity, suggested that it is wise to invest in stocks based on “local knowledge”—you invest in the stock of your local supermarket if you notice that it does better than expected. In

an efficient stock market, is this a wise recommendation?

Yes. Even in the efficient market, individuals may have different information. And people can still make money based on insider information. The local knowledge can be regarded as insider information comparing to others outside without the same information as you.

**Q 12.28.** Evaluate the following statement: It does not matter what portfolio you are holding in a perfect and efficient stock market.

False. Two portfolios may have the same returns, but different volatility. Some people may prefer high risk while some may prefer low risk.

**Q 12.29.** A paper by Frieder and Zittrain looked at a large sample of spam email touting a particular stock. Such distributions increased the trading volume and resulted in a 4–5% gain over the 2 days following the spam release. Is this evidence against market efficiency?

No. Insider information can still beat the market even in efficient market.

**Q 12.30.** What are the three main categories in the traditional market efficiency classification? Give an example of what each excludes.

1. In weak efficiency market, market price incorporates all the history information. Investors cannot get excess return based on technical analysis.
2. In semi-strong efficiency market, market price incorporates all the public information in addition. Investors cannot get excess return based on technical analysis or fundamental analysis.
3. In strong efficiency market, market price incorporates all the information. Investors cannot get excess return at all.

**Q 12.31.** Comment on the following statement: “An efficient market seems like an impossible concept. In an efficient market, no one can earn excess returns. Therefore, no one collects information. Therefore, prices do not contain information, and collecting information should earn excess returns.”

False. In the efficient market, the market price has used all available information. However, individuals may have different information from others, or have different opinion on the same information. You can still earn excess returns than others based on your information.

**Q 12.32.** Describe the fundamentals-based classification of the strength of belief in market efficiency. Explain how one individual can be at one level but not in the level above or below.

**Q 12.33.** Does a random walk imply that the expected rate of return on a stock is zero?

No. There could be a drift term in the random walk, so that the expected rate of return can be positive or negative.

**Q 12.34.** Define arbitrage. How is it different from a great bet? Is one always better than the other?

Arbitrage is that you can have definite nonnegative return with 0 initial cost.

A great bet is that you are very likely to have a positive return with some initial cost.

No, sometimes the profits by arbitrage exists but is very little. Although you have the initial costs in a great bet, you may have great profits by the bet.

**Q 12.35.** Would it make sense for a model of the financial world to assume that there is no arbitrage? Would it make sense for a model of the financial world to assume that there are no great bets?

Yes, many models assume that there is no arbitrage, such as Black-Scholes model.

**Q 12.36.** Assume that the typical day-to-day noise (standard deviation) is about 100 basis points. Assume that you have the kind of stock-picking ability that earns you an extra 400 basis points per annum. Assume no transaction costs. Ignore compounding and assume that your rate of return is the sum of returns over trading days. Assume there are 252 trading days per year.

1. With only 1 day of performance, how much extra do you expect to earn per day?

400 / 252 = 1.587 basis points

2. How bad is your noise over 1 day?

100 basis points

3. What is your expected T-statistic (the excess mean divided by the standard deviation)?

1.587 / 100 = 0.01587

4. With 252 trading days of performance, how much extra do you expect to earn per annum?

400 basis points

5. How bad is your noise over 252 days?

6. What is your expected T-statistic now?

400 / 1587.45 = 0.252

7. Work out how many years you would expect to wait before you would obtain statistically significant evidence to prove that you have a positive ability to pick stocks.

Assume you want a 95% confident interval. , ,

**Q 12.37.** What kind of costs should you consider when evaluating whether an opportunity is an arbitrage?

Transaction costs and taxes.

**Q 12.38.** The typical hedge fund investor evaluates its fund based on the most recent three years of performance. What do you think of this practice?

It’s not a good practice. As we have calculated above, it takes several decades to show if a trader has the ability to get excess return. 3 years is a very short horizon so that most of the performance may be purely by luck.

**Q 12.39.** Why does the average mutual fund in the market today appear to have been a great performer? Does this evidence suggest that these funds will be good performers in the future, at least on average?

Because of survival bias, the funds did not have a good performance have already closed.

This evidence cannot suggest that they will be good performers in the future, even on average.

**Q 12.40.** Do you expect fund managers with high ability to prefer compensation that is more performance based? How good an “insurance” is this for fund investors?

Yes, fund managers with high ability would prefer performance-based compensation.

This is not a good insurance at all. Because with this kind of compensation, managers will tend to invest in high risk assets, so that they will get high compensation when they perform well.

**Q 12.41.** If a corporation acquires another firm, it can lower the firm’s uncertainty. This should lower its cost of capital. This should create value. Is this correct?

False. If the corporation pays less than the intrinsic value of the firm, it may higher the firm’s uncertainty. And it makes the cost of capital higher.

This does not create any value. If the corporation pays higher than the market value of the firm, the value of the firm increases, but the value of the corporation decreases. In together, no value was created.

**Q 12.42.** Give an example of how the cost of capital for taking a project can be too high if the market has undervalued your firm.

For example, assume you know that your current projects will return $500 tomorrow. Also assume that you have no cash and that you can only raise financing through equity. Now assume you come across a new project that costs $100 and will return a terrific $200 tomorrow. The problem is that your investors do not believe that the firm will return $700, falsely believing that the combined firm will only be worth, say, $200. Thus, to raise $100, you would have to sell 50% of your firm, and keep only 50% of the true $700 return, for a true $350 share of it. You would therefore be better off passing up this new project and just taking the $500 from the old project. Put differently, the opportunity cost of new capital to fund this project is way too high for you.

**Q 12.43.** For convenience, assume a zero discount rate. You know that your current projects cost $400 today and will truly return $500 next year—but your investors believe they will return only $400. In addition, you have no cash on hand and can only raise financing for new projects by issuing more equity. A new project costs $200 and will return $220 next year. Your investors mistakenly believe that your firm will earn an internal rate of return of 0%, either with or without this new project. Acting on behalf of your existing investors, should you take this project? Does it have a positive NPV?

No, I will not take this project. Because the existing investors believe that the return is 0%. They will not pay more for a new project.