

Session 9

Random Walks and Momentum

Tests

1. In the random walk hypothesis, the asset price follows a random walk, where the price movement in each period is completely uncorrelated with movements in prior periods. For prices to follow a random walk, which of the following assumptions needs to hold?
 - a. All existing information about the asset should be impounded into the current price
 - b. Investors are unbiased in setting expectations (they don't consistently set them too high or too low).
 - c. Investors react instantaneously to new information
 - d. The investor reaction to new information is unbiased
 - e. All of the above
2. One test of whether assets follow a random walk is to estimate the serial correlation in returns over time periods. With very short time periods, you can sometimes get serial correlation that reflects market structure and illiquidity more than inefficiency. If you have a market that is not liquid and you are computing the returns on a market index, which of the following would you expect to find?
 - a. Zero serial correlation
 - b. Negative serial correlation
 - c. Positive serial correlation

Bonus: Explain why and whether you can you exploit this serial correlation to make money? Why or why not?

3. When you go from very short time periods (seconds, minutes) to slightly longer intervals (days), you do find some evidence of negative correlation with individual stocks. While this correlation may be statistically significant, which of the following has to hold for it to have economic significance?
 - a. There can be no trading costs
 - b. The returns have to be very large
 - c. The returns have to exceed the trading costs
 - d. The returns have to be less than the trading costs
4. As you go from days to weeks and even months, the serial correlation in returns becomes positive. This momentum effect suggests that stocks that have done well will continue to do well and stocks that have done badly will continue to under perform. If you decide to play the momentum game, which of the following groups of stocks offers the most promise of continuing momentum?
 - a. Large market cap stocks where momentum has been accompanied by high trading volume.
 - b. Large market cap stocks where momentum has been accompanied by low trading volume.

- c. Small market cap stocks where momentum has been accompanied by high trading volume.
- d. Small market cap stocks where momentum has been accompanied by low trading volume.

Bonus: What is the biggest risk to a momentum strategy?

5. In long period returns (3 to 5 year returns), there is evidence of negative serial correlation, where the losers of the last period tend to become winners over the the next few periods. Assume that you decide to take advantage of this by adopting a contrarian strategy of buying the stocks that have gone down the most in the past five years. Which of the following would concern you about this portfolio?
- a. Given the price performance, many of the companies will have low priced stocks, with high transactions costs.
 - b. The drop in stock prices may also have increased financial leverage (debt ratios) at these companies and made them riskier equity investments.
 - c. These companies are at higher risk of defaulting or being delisted than other companies in the market.
 - d. Some of these companies might be in declining businesses where there are no turnaround prospects.
 - e. All of the above

Solution

1. In the random walk hypothesis, the asset price follows a random walk, where the price movement in each period is completely uncorrelated with movements in prior periods. For prices to follow a random walk, which of the following assumptions needs to hold?
 - a. All existing information about the asset should be impounded into the current price
 - b. Investors are unbiased in setting expectations (they don't consistently set them too high or too low).
 - c. Investors react instantaneously to new information
 - d. The investor reaction to new information is unbiased
 - e. **All of the above**

Explanation: For the asset price to form a random walk, the current price should reflect all information and not be biased up or down. The next piece of information should have just as much of a chance of being good as bad news, and for that to be true, expectations cannot be set too high or too low. Finally, when the news comes out there can be no over or under reaction.

2. One test of whether assets follow a random walk is to estimate the serial correlation in returns over time periods. With very short time periods, you can sometimes get serial correlation that reflects market structure and illiquidity more than inefficiency. If you have a market that is not liquid and you are computing the returns on a market index, which of the following would you expect to find?
 - a. Zero serial correlation
 - b. Negative serial correlation
 - c. **Positive serial correlation**

Bonus: Explain why and whether you can you exploit this serial correlation to make money? Why or why not?

Explanation: Since some of the stocks in the index will not trade, there will be a carry over into the next trading period. Thus, if you have a really positive period in the market, the stocks that don't trade during that period, when they do trade, will go up, creating positive serial correlation. You cannot really try to exploit this serial correlation, since trading on it will cause the reason for its existence (non trading) to disappear. It is more an artifact of non-trading than an inefficiency.

3. When you go from very short time periods (seconds, minutes) to slightly longer intervals (days), you do find some evidence of negative correlation with individual stocks. While this correlation may be statistically significant, which of the following has to hold for it to have economic significance?
 - a. There can be no trading costs
 - b. The returns have to be large
 - c. **The excess returns have to exceed the trading costs**

- d. The excess returns have to be less than the trading costs

Explanation: For an investor to make money of this strategy, the returns from the strategy have to exceed the trading costs. Those trading costs will include price impact, bid ask spread and brokerage costs.

4. As you go from days to weeks and even months, the serial correlation in returns becomes positive. This momentum effect suggests that stocks that have done well will continue to do well and stocks that have done badly will continue to under perform. If you decide to play the momentum game, which of the following groups of stocks offers the most promise of continuing momentum?
 - a. Large market cap stocks where momentum has been accompanied by high trading volume.
 - b. Large market cap stocks where momentum has been accompanied by low trading volume.
 - c. Small market cap stocks where momentum has been accompanied by high trading volume.**
 - d. Small market cap stocks where momentum has been accompanied by low trading volume.

Bonus: What is the biggest risk to a momentum strategy?

Explanation: Studies indicate that the momentum effect is greater for small cap companies than for large companies and higher when trading volume is high rather than low. The risk with any momentum strategy is that you will catch the shift in momentum when it happens (because it can happen suddenly and not always in predictable ways).

5. In long period returns (3 to 5 year returns), there is evidence of negative serial correlation, where the losers of the last period tend to become winners over the next few periods. Assume that you decide to take advantage of this by adopting a contrarian strategy of buying the stocks that have gone down the most in the past five years. Which of the following would concern you about this portfolio?
 - a. Given the price performance, many of the companies will have low priced stocks, with high transactions costs.
 - b. The drop in stock prices may also have increased financial leverage (debt ratios) at these companies and made them riskier equity investments.
 - c. These companies are at higher risk of defaulting or being delisted than other companies in the market.
 - d. Some of these companies might be in declining businesses where there are no turnaround prospects.
 - e. All of the above**

Explanation: Loser stocks will tend to be low-priced stocks and the drop in market value of equity will also increase financial leverage (making the equity riskier) and perhaps putting these companies at risk of default.