

Session 8

Market Efficiency II: Testing market beating schemes and strategies

Test

1. To test whether an investment strategy beats the market, you have to adjust the returns on the strategy for risk. Assume that you test a strategy and find that it makes excess returns after adjusting for risk using the CAPM (with beta used to measure risk). Which of the following conclusions could you draw?
 - a. The strategy beat the market during the testing period
 - b. The CAPM is not the right model for risk
 - c. The CAPM is the right model for risk but you misestimated the beta of your strategy
 - d. Any of the above
2. Assume that you have a strategy that has delivered an annual return of 12% a year for the last 10 years, with an annualized standard deviation of 30%. The market over the same period had an annual return of 10% over the same period with an annualized standard deviation of 20%. On a Sharpe ratio basis, how did your portfolio do, relative to the market?
 - a. It did 1.25 times better than the market
 - b. It did 1.2 times better than the market
 - c. It did as well as the market
 - d. It did 0.8 times as well as the market
 - e. None of the above
3. You believe that it is good news for investors in a company when a long time CEO is forced to resign. You collect information on announcements of forced CEO resignations and the risk-adjusted returns in the days before, during and after the announcements. Across the companies, you notice that stock prices are up 2% in the ten days before the announcement, jump another 5% on the announcement and go up another 3% in the ten days after the announcement. Which of the following conclusions would you draw?
 - a. Your hypothesis is correct. Forced CEO resignations are good news for investors, on average.
 - b. There are insiders who have access to the information in the days before the announcement who trade on that information
 - c. The news announcement is still a surprise to most in the market (albeit a positive one).
 - d. Investors are still unsettled after the announcement and take a while to adjust to the news.
 - e. All of the above.
4. You believe that small market-cap companies that are lightly held by institutions deliver much higher risk adjusted returns than the rest of the market. Which of the following would be the best test of this proposition?
 - a. Starting with a sample of all publicly traded companies today, find companies that have small market capitalizations and low institutional

- holdings today and estimate the returns you would have made, relative to the market, over the last 5 years.
- b. Starting with a sample of all publicly traded companies today, find companies that had small market capitalization and low institutional holdings five years ago and estimate the returns you would have made, relative to the market, over the last 5 years
 - c. Starting with a sample of all publicly traded companies five years ago, find companies that have small market capitalizations and low institutional holdings today and estimate the returns you would have made, relative to the market, over the last 5 years.
 - d. Starting with a sample of all publicly traded companies five years ago, find companies that have small market capitalizations and low institutional holdings then and estimate the returns you would have made, relative to the market, over the last 5 years.
5. Assume that you have just tested a strategy that is purported to beat the market. On paper, over the last decade, this strategy would have generated an annual return of 11% while the annual return on the market was 9%. The strategy does have transactions & trading costs that amount to 1% annually and it is slightly more risky (beta = 1.2) than the market. If the risk free rate was 3% over the ten-year period, what is the risk-adjusted, trading-cost adjusted return to this strategy?
- a. -0.8%
 - b. -0.2%
 - c. 0.2%
 - d. 0.8%
 - e. 1.0%
 - f. 2.0%

Bonus: What would the beta need to be on this strategy for its to break even on a risk adjusted, trading cost adjusted basis?

Solution

1. To test whether an investment strategy beats the market, you have to adjust the returns on the strategy for risk. Assume that you test a strategy and find that it makes excess returns after adjusting for risk using the CAPM (with beta used to measure risk). Which of the following conclusions could you draw?
 - a. The strategy beat the market during the testing period
 - b. The CAPM is not the right model for risk
 - c. The CAPM is the right model for risk but you misestimated the beta of your strategy
 - d. Any or all of the above**

Explanation: When a strategy delivers risk-adjusted excess returns, it is possible that the strategy is a market beater or that you used the wrong model to adjust for risk or that you misestimated the risk parameter(s) in that model.

2. Assume that you have a strategy that has delivered an annual return of 12% a year for the last 10 years, with an annualized standard deviation of 30%. The market over the same period had an annual return of 10% over the same period with an annualized standard deviation of 20%. On a Sharpe ratio basis, how did your portfolio do, relative to the market?
 - a. It did 1.25 times better than the market
 - b. It did 1.2 times better than the market
 - c. It did as well as the market
 - d. It did 0.8 times as well as the market**
 - e. None of the above

Explanation: Sharpe ratio for your strategy = $12\%/30\% = 0.4$; Sharpe ratio for the market = $10\%/20\% = 0.5$. Your strategy delivered 20% less return per unit of risk than the market.

3. You believe that it is good news for investors in a company when a long time CEO is forced to resign. You collect information on announcements of forced CEO resignations and the risk-adjusted returns in the days before, during and after the announcements. Across the companies, you notice that stock prices are up 2% in the ten days before the announcement, jump another 5% on the announcement and go up another 3% in the ten days after the announcement. Which of the following conclusions would you draw?
 - a. Your hypothesis is correct. Forced CEO resignations are good news for investors, on average.
 - b. There are insiders who have access to the information in the days before the announcement who trade on that information
 - c. The news announcement is still a surprise to most in the market (albeit a positive one).
 - d. Investors are still unsettled after the announcement and take a while to adjust to the news.
 - e. All of the above.**

Explanation: The price rise before the announcement is consistent with insiders trading ahead of the report, the jump on the announcement suggests that it is good news and still a surprise to the rest of the market and the drift afterwards suggest that investors are adjusting gradually to the news.

4. You believe that small market-cap companies that are lightly held by institutions deliver much higher risk adjusted returns than the rest of the market. Which of the following would be the best test of this proposition?
 - a. Starting with a sample of all publicly traded companies today, find companies that have small market capitalizations and low institutional holdings today and estimate the returns you would have made, relative to the market, over the last 5 years.
 - b. Starting with a sample of all publicly traded companies today, find companies that had small market capitalization and low institutional holdings five years ago and estimate the returns you would have made, relative to the market, over the last 5 years
 - c. Starting with a sample of all publicly traded companies five years ago, find companies that have small market capitalizations and low institutional holdings today and estimate the returns you would have made, relative to the market, over the last 5 years.
 - d. Starting with a sample of all publicly traded companies five years ago, find companies that have small market capitalizations and low institutional holdings then and estimate the returns you would have made, relative to the market, over the last 5 years.**

Explanation: To remove sampling and survivor bias, you have to create your portfolios based on what would have been available to you five years ago. Thus, if some of the firms fail/default/are acquired, that will be reflected in your portfolio returns.

5. Assume that you have just tested a strategy that is purported to beat the market. On paper, over the last decade, this strategy would have generated an annual return of 11%, prior to trading costs, while the annual return on the market was 9%. The strategy does have trading costs that amount to 1% annually and it is slightly more risky (beta = 1.2) than the market. If the risk free rate was 3% over the ten-year period, what is the risk-adjusted, trading-cost adjusted return to this strategy?
 - a. -0.8%
 - b. -0.2%**
 - c. 0.2%
 - d. 0.8%
 - e. 1.0%
 - f. 2.0%

Bonus: What would the beta need to be on this strategy for its to break even on a risk adjusted, trading cost adjusted basis?

Explanation: Expected return given beta = 3% + 1.2 (9% -3%) = 10.2%

Actual return after transactions costs = 11% -1 % = 10%

Excess return = 10% - 10.2% = -0.2%

Bonus question

For this strategy to break even, the expected return would have to be 10%

3% + Beta (9% -3%) = 10%

Beta = 1.1667