FINC-780

Trading Rule Back Testing

Due Date: please see syllabus

Concept:

Because of systematic market inefficiencies, traders employ rule-based trading. Also called algorithmic trading, this is the buying and selling of stocks based on "signals" such a death cross, etc. Before you implement a trading rule with real money, you would like to back test it – this means that you try to answer the question: "what if I had used this strategy in the past"? This is a form of simulation in which you use real data, but these data are from the past. In this project, you examine one of the common signals traders use and perform such simulation.

Requirements:

1. Write and run the three functions described below.
2. Conduct research to understand the signal used and link it to behavioral finance. Show this understanding in report.
3. Use usual reporting procedures (introduction, conclusion, etc.). Produce a pdf file <= 10 pages long

Description of the three Functions:

Function 1: Base level Back Test

Input: TICKER for security, begin date for back testing, end date for back testing, threshold for DVI (set to default value of 0.5).

Output: Apply the rule of long when DVI < 0.5 and short otherwise and summarizes results during the testing period. The summary must contain (a) the total number of long trades (b) the total number of short trades (c) the percent of time the portfolio is long (d) the percent of time the portfolio is short, and (e) the cumulative return from the strategy.

Show results for: ("JNJ", "20140101", "20171231", 0.5)

Function 2: Simulate multiple Back Test Periods (using all possible periods in interval for back testing). For example, if the testing period is 2 years, and data is available for 2010-4, then you would analyze 2010-11, 2011-12, 2012-13 and 2013-14 (four simulations)

Input: TICKER for security, testing period (years), date range (YYYY-YYYY) for overall data availability, threshold for DVI (set to default value of 0.5).

Output: Table1 containing the means (over iterations) of the 5 items indicated in Function 1. Plot 1 (use ggplot) containing the cumulative return from the strategy.

Show results for: ("JNJ" ,3, c("2010", "2016"),0.5)

Function 3: Simulate multiple DVI thresholds

Input: TICKER for security, begin date for back testing, end date for back testing, low value for threshold, high value for threshold, increments.

Output: Table containing (a) DVI threshold (b) the total number of long trades (c) the total number of short trades and (d) the cumulative return from the strategy. Also, a plot where x = threshold value and y = cumulative return.

Show results for: ("JNJ", "20140101", "20171231", 0.4, 0.6, 0.01).

Additional Explanation

1. You can adapt the code displayed in: http://blog.fosstrading.com/2011/03/how-to-backtest-strategy-in-r.html.
2. Strive for efficiency in coding. The most important function is Function 1. You should be able to call Function 1 from within Functions 2 and 3.
3. You can use a for-loop in Function 2 to cycle through the various sample years.