

Statistics 434: Homework No. 7

Creation of a Personal Index

Get one year's worth of daily returns from CRSP for four to ten stocks that will make up the components of your personal index. These can be widely differing firms, or they can all be within one industry group, or within one theme group (such as "good for the Earth" or "once owned by Carl Icahn"). Amuse yourself. Create the return series for an initially equal-weighted non-rebalanced portfolio which you can call IDX.

Now Some Analysis

1. Form three "lagged smoothers" for IDX. For example, these could be a simple average of the preceding 5 days returns, 10 days returns, and 15 days returns. If you like, you can use exponential averages, or other weighted averages, or other "window" sizes.
2. Now, fit a time series regression model for IDX using an autoregressive component and a regression component with appropriately lagged versions of your smoothers as the independent variables.
3. Evaluate your model as carefully as you can.
 - (a) Evaluate the significance of the coefficients in your model. Comment on the quality of the fit. What do you learn from the various diagnostic plots for the residuals? What do you learn from a plot of fitted versus observed values?
 - (b) Does it look like your model has practical merit? What are the weak points and strong points of the analysis?

A Little Flexibility — And A Project Your New "Boss" Can Like

You have an index, it may not be the market, but it is an index. You can look at your own personal version of CAPM. Explore this idea if it appeals to you. Specifically, you might consider each the individual stocks from within your set of index stocks and test if the stock has a significant alpha or beta vis-a-vis your own personal index.

Incidentally, this suggests a way to bring a little statistical analysis into the context of a money management firm that has a *view* about the stocks it wants to own. As a junior person (and a quant to boot) you don't have the right to challenge the *view* but you can be a hero if you find creative ways to tinker with it. For example, if a stock S in the firm's portfolio has a significant alpha when measured against the firm's portfolio (the analog to your IDX), then you can argue for adding a little more of S when it comes time to put some more cash to work. There are lots of variations on this theme. This may not be fancy portfolio theory, but it can create some interesting conversations.