

Assignment #4

This assignment is due in class next Thursday, February 25, 1999. As with previous assignments, I expect that you will talk to classmates about the assignment, but expect each of you to do the work yourself.

For this assignment, you will be experimenting with stepwise regression using the data in the data set *NewNineties.jmp* found on the class web page. This file contains the stock market returns (and random predictors) that we considered in Lecture 9. It also includes (in columns US-Italy through CPI-food) a collection of macroeconomic data. Each economic series has been differenced so that it, like market returns, tracks changes in the economic characteristic. Broadly grouped, these economic factors measure US trade balances, US imports, construction activity, unemployment data, labor force, money supply, personal consumption expenditures, and price indices.

- (1) Using your knowledge of macroeconomics, pick 20 predictors for use in a regression model for the VW return series (1990-1993, in the 3rd column).
 - (a) Fit the regression and summarize how well your model predicts returns. Does the model explain significant amounts of variation in returns?
 - (b) How many coefficients are significant at the usual 0.05 level? How many slopes would you expect to be significant by chance alone?
 - (c) Apply the Bonferroni rule to the coefficients. Are any significant now? Is this use of Bonferroni appropriate?
- (2) For this question, you'll explore the use of the stepwise regression tool. In each case, the response is the VW return, with the full set of economic factors forming the set of potential predictors.
 - (a) Run stepwise forward, then backward using the default settings.
 - i) Does the overall fit explain significant variation in returns? Explain.
 - ii) How many predictors enter the model? Show the parameter table.
 - iii) How many of these predictors pass the naïve Bonferroni test?
 - (b) Repeat "a", but now using an altered setting in stepwise. Set "Prob to Enter" at 0.35. This will make it easier for more factors to initially enter the model. Leave the "Prob to Leave" setting alone.
 - (c) Contrast the results obtained in steps "a" to those found in "b". Explain, if you can, any differences observed in the results.
- (3) Provide an economic interpretation of the model chosen by the stepwise regression procedure used in part "b" above. A brief theory will do.
- (4) Use the "Save Prediction Formula" feature (accessed at the \$ sign) to save the predicted values from the model fit in part "b". Compare these predictions for 1994 to the actual series, found in what was the last column of the data sheet (before you added the predictions). Are the predictions as accurate as the model claimed they would be?
- (5) Repeat "2a", but using a different setting in stepwise than in "b". Set "Prob to Enter" at 0.5. This will make it yet easier for more factors to initially enter the model. Leave the "Prob to Leave" setting alone. What happens now?