

Statistics 956 Homework No. 8 : UP-DATED
Due Monday March 28.

Reading You should read sections 9.2 and 9.4 of Z&W and review class notes.

Temporal Aggregation of Returns

- Write an S-function that takes a series of returns and computes an estimate of the standard deviation of the “ k -day return.” Specifically, assuming just that $\{r_t\}$ is a stationary process and assuming that k is given, your function should take the vector of returns $\{r_t\}$ and compute an estimate of the standard deviation of $r_1 + r_2 + \dots + r_k$.
- Use your function to compute the **variance** of the k -day return for your “favorite” stock for $k = 1, 2, \dots, 60$. Call this vector v , so $v[k]$ is your estimated k -day standard deviation.
- Now, regress $v[k]$ against k . Recall that if your returns were IID then this regression should give $\hat{\alpha} = 0$ and $\hat{\beta} = 1$. How did you do? Are your values significantly different from 0 and 1. How do you interpret this? (Note: This *simplifies and improves* the “standard deviation” version of this problem that I described in class.)
- As a safeguard against possible coding errors, definitional errors, or errors of interpretation, repeat this calculation with “returns” that are simulated by taking IID normals with a suitable mean and variance. You know for certain what you should get this time. Did you get what you expected?

CAPM for your Favorite Stock

- Consider the discussion of CAPM and the analysis of MSFT in section 9.4 of Z&W and perform a “similar” analysis for your favorite stock.
- Since you are well familiar with your series of daily returns, I suggest that you use daily data rather than the monthly data used in 9.4. You will need to get the matching SP500 data from WRDS. Be careful that your series really do match up.
- Interpret your results. How close to constant are α_t and β_t ? Valueline and other advisory services encourage the use of β_t as a guide to understanding the riskiness of a stock. To what extent are subscribers well served by this advice? Some money managers compare stocks and create preference lists using α_t ? Can you comment on this?

How to Present Your Work

Presentation should not be much of a problem this time, but please do take a moment to write *an additional paragraph or two* about what you learned from this exercise. Such an “extra moment” is useful for anyone, and it also helps to enrich our class discussions.