Grader's comments (Homework #6)

#1.

a. You need to interpret. Make note that time (t and $t-1$) plays a role on the regression model.
b. I got

$$LM = 23.48$$

and

$$t = -5.09$$

c. Interval is

$$(-86.40, 30.82)$$

#2.

When the correlation between the current and previous period error is weaker, the correlations between the current error and the errors at more distant lags die out relatively more quickly.

#3.

b.
i) $(-0.2626, -0.1322)$

ii) $t = 1.815$

iii) There are a number of ways to calcuate late $se(\hat{G}_N)$.

1. Follow the book's hint and run a test of the said null hypothesis. A Wald test would. If you are lucky, your software outputs an estimate and a standard error of the quantity: $\frac{\hat{\alpha}}{\hat{\gamma}} - 1$. Use this standard error as your $se(\hat{G}_N)$.

2. Run a nonlinear fit on the following model:

$$DU_t = -(\beta_0 + \beta_1 + \beta_2) * G_N + \beta_0 * G_{t-0} + \beta_1 * G_{t-1} + \beta_2 * G_{t-2}$$

and obtains a standard error of $\hat{G}_N$ (note that G_N is meant to be a parameter; G_t, G_{t-1}, G_{t-2} are regressors). Assume that $\hat{G}_N$ is asymptotically normal and you are in business.

3. Actually, what I just said is not exactly right. You should really do a Maximum Likelihood Estimation (MLE) of the model in 2. MLE guarantees asymptotic normality. Standard interval construction follows.

4. Notice that all three methods mentioned above require non-linear maximization. You can get away without relying on raw computation power by appealing

to a vector form of the Delta Method. That is, derive an asymptotic estimate of $se(\hat{G}_N)$ using the errors of $\hat{\alpha}$ and $\hat{\gamma}$. This approach is cheap (if you remember the day of running things on P5-based pentium). This may give very imprecise results in practice.

1), 2) and 3) yields $se(\hat{G}_N) = 0.0417$. Of course, $\hat{G}_N = 1.336$.

#4.

#5.