Exam on Topics from Chapters 2 through 10 (1.5 hours)

Suppose consumption is determined by not current income but by "expected income" (Y_t^*). Also assume that consumers revise their expectations according to the adaptive expectations scheme described in Section 10.2. We then have the following two equations (ignoring error terms).

$$C_t = a + b Y_t^*$$
$$Y_t^* = l Y_{t-1}^* + (1-l)Y_{t-1}$$

You have data only on C_t and Y_t and none on Y_t^*.

1. (10 points)
Derive an estimable econometric formulation for C_t. Add the error term u_t to the model you derive. Describe how you can obtain estimates of the parameters of the above equations from your econometric model.

2. (5 points)
State the properties of the OLS estimators of a, b, and l when u_t satisfies Assumptions 3.2 through 3.8. You should address the issues of unbiasedness, consistent, efficiency, and the validation of hypothesis tests. How are these modified if u_t is serially correlated.?

3. (10 points)
Using annual data for 36 years, the following model estimates were obtained.

$$\hat{C}_t = 29685.821 + 0.726 C_{t-1} - 0.439 Y_{t-1}$$

Derive the estimates of a, b, and l from these and compute the long-run marginal propensity to consume. Are the results sensible?

4. (10 points)
Describe step by step how you can use the Augmented Dickey-Fuller test for $\ln(C_t)$ and $\ln(Y_t)$.

5. (10 points)

Construct an error correction model for the consumption function that relates $\ln(C_t)$ and $\ln(Y_t)$.

6. (5points)

Describe the procedure for testing whether the variables C_t and Y_t are cointegrated.

7. (5 points)

 Describe the procedure for carrying out a Granger-causality test for the variables C_t and Y_t. Select the lag order to be 4 periods.