Bent E. Sørensen

ECONOMICS 7344 – MACROECONOMIC THEORY II, part b, Spring 2018

Homework 3. March 28, due Wednesday April 4.

1. (20% of Midterm 1, 2016) Assume that a consumer has a utility function $U(C)$ where U is monotonically increasing and strictly concave. Assume that the consumer maximizes

$$\Sigma_{t=0}^{\infty} \beta^t \, U(C_t),$$

subject to a flow of known income y_t and initial wealth. Also assume that the interest rate is equal to the discount rate.
a) Show that consumption is constant over time.
b) Assume that $y_0 = 10$, $A_0 = 100$, and

$$y_t = 1.1 \, y_{t-1}.$$

If the interest rate is 20% (implying that the discount factor $\beta = 1/1.2$), what is the level of consumption?

2. (20% of Midterm 1, 2016) a) Explain what is meant by "excess sensitivity of consumption."
b) Explain what is meant by "excess smoothness of consumption."
In either question, you have to be as explicit as was the coverage in class.

3. (20% of Midterm 2, 2016) This question is about the Campbell-Mankiw rule-of-thumb (rot) consumer model.

a) Write down the model and explain the content.
b) Assume that you have time series of data on (aggregate) income and consumption. Let y_t be income and c_t be consumption. Assume that income is well describe by a stationary AR(1) in differences and that the covariance between Δy_t and Δy_{t-1} is 0.5 while the variance of Δy_t is 1.0. Further assume that when you regress Δc_t on Δy_{t-1}

you get a coefficient of 0.4.

Given these numbers, what is the fraction of rot consumers in the Campbell-Mankiw model?

4. (16% of the January 2009 core exam) This is about the CAPM, so you may want to wait till after Monday class.

(a)(4%) Explain, using a figure, how to find the efficient frontier when a safe asset exists with return r^f. (This is under the assumptions of the CAPM—I ask about the efficient frontier with the safe asset, not the efficient frontier of risky assets although that has to be part of the answer.)

(b) (4%) Write down the formula for the CAPM and explain all terms precisely. (Do not derive the CAPM.)

(c) (8%) Consider two assets. Assume the CAPM holds. Asset A has pay-out PO_A which has a correlation of 0.2 with the market return while asset B has pay-out PO_B which has a correlation of 0.4 with the market return. If the standard deviation of the return to asset A is 1.5 times the standard deviation of the return to asset B, which asset will have the highest expected rate of return?