

Exam #1: Part II

Business Cycles & Forecasting
Economics 392

Due date: 10/15/2015
Instructor: Dr. I-Ming Chiu

Part II (30%)

Instructions:

Please answer **BOTH** questions in part II using R software. Please copy and past **all** of your R codes and outcomes to a **word file**. Additional explanations can then be added by typing into the same word file. Please prepare a cover page that **states your Name** and **staple** all the pages together. Part II will be collected on Thursday, October 15 in our class meeting. **There is no extension on this test**, so please submit your test on time.

Q1. (10 pts) We have learned how to code the Accelerator-Multiplier (AM) model using R. In this question, you need to code a modified AM model that's shown in the following:

Modified AM Model based on Samuelson's 1939 paper

$$Y_t = C_t + I_t + G_t + NX_t \quad (1)$$

$$C_t = \alpha * Y_{t-1} \quad (2)$$

$$I_t = \beta * (C_t - C_{t-1}) \quad (3)$$

$$G_t = \$1 \quad (4)$$

$$NX_t = \$1 - \delta * Y_{t-1} \quad (5)$$

a) Present your R code

b) Show the path of real GDP (Y) using $\alpha = 0.5$, $\beta = 1.2$, and $\delta = 0.1$. Does Y converge (i.e., become stable) eventually?

[You can decide the number of periods by yourself, but it can not be less than 18 periods]

- Q2. (20 pts) A data file, BodyTemperature.txt, can be found in the Exam#1_Part2 subfolder on sakai. It consists of four variables; “Gender”, “Age”, “HeartRate”, and “Temperature”. Once you start your R session, please execute the file (can be found in the same folder), 392_Exam#1_Part2_Q2.txt. The R code transforms the “Age” variable to three categories, i.e., group1/group2/group3, that represent young, middle age and old people.
- Create and present a frequency table where the “Age” variable is in rows and the “Gender” variable is in columns.
 - Select an individual at random and it’s a male. What is the probability that he belongs to the second group (middle age)?
 - Select an individual at random and found who belongs to the second group. What is the probability the gender is a male?
 - Make comparative boxplots (see the upper graphs in example one on page four of Handout #4), then examine and report how the “Gender” variable affects the “HeartRate” variable. Utilize the five number summary to provide a detailed explanation.
 - Make comparative boxplots, then examine and report how the “Age” variable affects the “HeartRate” variable. Utilize the five number summary to provide a detailed explanation.