

Econ 222 Macroeconomic Theory 1

Assignment 2

February 29, 2000

Due Date: In class, Thursday, February 17th, 2000.

1. [25] Consider an economy with the following information:

$$Y = 100N - 2N^2, \quad (1)$$

$$\omega = 10 + \frac{1}{2}N^s, \quad (2)$$

$$C^d = 125 + 0.6(Y - T) - 225r, \quad (3)$$

$$I^d = 300 - 200r. \quad (4)$$

The first equation is the national production function, where a certain level of labour input N will generate output Y . The second equation is inverse labour supply and determines labour supply N^s for every real wage ω . The third equation gives the level of desired consumption given output Y , taxes T , and real interest rates r . The fourth equation gives the level of desired investment for different interest rates.

- a) Derive the labour demand function. Determine the full employment level of employment \bar{N} , from the labour market equilibrium. Determine the full employment level of output \bar{Y} .
- b) Suppose $T = 250$ and government expenditure $G = 250$. State the equilibrium condition in the goods market and determine the interest rate that clears the goods market, \bar{r} , when the economy is operating at full employment. Determine long run desired savings and investment.

- c) Suppose this economy faces a real world interest rate of $r^w = 0.05$, and has no ability to affect it. In the presence of r^w determine desired savings and investment along with net exports. Explain why, or why not, domestic output would be affected by the real world interest rate.
2. [25] Suppose you divide your life into two periods: working and retirement age. When you work you earn labour income of Y , when you are retired you earn no labour income. Instead you can live off of your period one savings plus interest earned. You save an amount S while working, earning interest rate r . Since you don't need to consume as much when you are retired as when you are working, you prefer to set your consumption now twice as high as when you are retired. Denote consumption, when working as c_w and when retired as c_r
- a) Suppose you earn one million dollars over your working life and the real interest rate for retirement is 50 percent. How much do you save and how much do you consume in both periods?
- b) Suppose your current income went up to two million dollars when working. Now what will you save and consume in both periods?
- c) Suppose the interest rate rises to 55 percent. Starting from the position of question a), would you save more or less? Explain your answer.
- d) Suppose you wish to leave a bequest of 500,000 dollars to your children. Starting from the position of question a), determine consumption and savings, now and in the future.

3. [25] Consider two economies, denoted 1 and 2 with the following goods market information.

Economy 1:

$$\bar{Y}_1 = 1000, \quad (5)$$

$$C_1^d = 200 + 0.7(Y_1 - T_1) - 50r_1, \quad (6)$$

$$I_1^d = 800 - 200r_1. \quad (7)$$

Economy 2:

$$\bar{Y}_2 = 1500, \quad (8)$$

$$C_2^d = 400 + 0.6(Y_2 - T_2) - 25r_2, \quad (9)$$

$$I_2^d = 1000 - 150r_2. \quad (10)$$

We also have fiscal information for the two economies. Government expenditures are $G_1 = 150$ and $G_2 = 500$ respectively. While taxes are given by: $T_1 = 200$ and $T_2 = 450$ respectively.

- a) If both economies are closed, determine the interest rates that clear their respective goods' markets.
- b) Consider the case where both are large open economies. Determine the equilibrium interest rate which clears the goods market for these two economies. Determine the net exports of both economies at the equilibrium interest rate.
- c) Suppose that the second economy further increases government expenditures to 700 without changing its taxes. Determine the new equilibrium world interest rate and discuss how country 2 would finance its increased fiscal deficit.

4. [25]

Go to the Statscan website, specifically, the following two URLs:

<http://www.statscan.ca/english/Pgdb/Economy/Economic/econ01a.htm>

<http://www.statscan.ca/english/Pgdb/Economy/Economic/econ01b.htm>

The pages provide information for Canada's international balance of payments. Using this information rewrite Table 5.1 in your textbook for years 1997 and 1998. You will notice that Statistics Canada has made some revisions of numbers since the publication of the textbook.

Explain what factors led to an overall worsening of the current account balance in 1998?