Econ 222 Macroeconomic Theory 1

Assignment 1

January 18, 2000

Due Date: In class, Thursday, February 3rd, 2000.

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

Year	C	I	G	NX	T	TR	NFP
1998	500	300	100	-50	75	35	-10
1999		325	70	-45	100	25	0

Where values are given in billions of dollars, in each year.

a) Determine GDP, GNP, private and government savings and the current account balance in 1998. Assume that this country carries in no government debt from previous years and thus does not have to make interest payments on previous debt. What stock of government debt will be carried into 1999?

b) Suppose that the nominal interest rate on borrowing and lending is $i = 0.1$. How much must the government make in interest payments in 1999 for its outstanding debt? If consumption grew by ten percent what is the level of consumption in 1999? Now determine all variables from part a). How much did GNP grow in 1999?

c) Suppose this country has a stock of wealth, at the end of 1999, of 1000 billion dollars. Assuming that the value of the portfolio of national wealth did not change in 1999, determine the stock of wealth entering 1999.

2. [10] In the post-apocalyptic future, there is a place known only as Bartertown. In this town, people salvage very fast cars and produce gasoline for their cars. They also raise pigs which provide methane for gasoline production. In the year 2008, they salvaged 50 cars, but only were able to sell 40. The cost of salvaging any car was 1000 dollars and the market price for selling salvaged cars was 1250 dollars. They also produced and sold 30,000 litres of gasoline priced at 30 cents per litre (no federal or provincial taxes to worry about). However 10 cents on every litre was used to purchase feed as an input for pigs producing methane. In that year 40 pigs were purchased at 200 hundred dollars each. What was the GDP of Bartertown?

3. [15] In Kingston there are markets for two goods (Beer and Poutine), that are complementary. Consider the following supply and demand information.

$$B^d = 410 - 5P_B - 2P_p \qquad B^s = -60 + 3P_B$$

$$Q^d = 295 - P_B - 3P_p \qquad Q^s = -120 + 2P_p$$

where B measures beer and Q measures poutine. The price of beer is P_B and the price of poutine is P_p.

a) Consider the poutine market, assume that the price of beer is fixed at 55. Find the partial equilibrium price and quantity of poutine given beer prices.

b) Suppose the price of beer exogenously drops to 50. Find the new partial equilibrium price and quantity of poutine.

c) Determine the general equilibrium quantity and prices for both beer and poutine simultaneously.

4. [25] Consider a richer description of the national production function:

$$Y = 2K^{\frac{1}{4}}N_s^{\frac{1}{2}}N_u^{\frac{1}{4}}$$

where K represents the capital stock, N_s is skilled labour and N_u is unskilled labour.

a) Find the marginal product of unskilled and skilled labour. Show that each exhibits a diminishing marginal product.

b) Suppose that the capital stock is fixed at $\overline{K} = 10000$ and the supply of unskilled labour is fixed at $N_u^s = 50$. The supply function for skilled labour is given by: $N_s^s = 2w^s$. Determine equilibrium levels of unskilled and skilled labour employment along with the market clearing wages for the two markets.

c) Suppose the supply of unskilled labour increases to 60. Determine what happens the employment and wage levels in the two markets.

5. [15] A country has an aggregate production function of the form:

$$Y_t = A_t K_t^{.25} N_t^{.75}$$

The following table shows this country's Macroeconomic data for 1992 and 1993.

year	Y	K	N
1992	2000	1700	70
1993	2100	1785	75

a) Determine total factor productivity, A_t, in 1992 and 1993. How much did total factor productivity grow from 1992 to 1993?

b) If total factor productivity remains constant from 1993 to 1994 and the labour force grows from 75 to 80, how much will the capital stock have to grow in order to produce an output of 2200 in 1994?

6. [10] Go to the Cansim database homepage and retreive data on the following macroeconomic variables for 1995 and 1996 relating to unemployment.

Data Series	Description
D980120	Number of Employed Workers
D980048	Number of Labour Force Participants
D980466	Labour Force Participation Rates

a) Determine the size of the adult population in 1995 and 1996.

b) Determine the unemployment rates and employment ratios in 1995 and 1996.