International Macroeconomics Review Questions I

John E. Floyd
University of Toronto
April 16, 2013

Mathematics Review

1. Take the total differential of the production function

$$Y = F(L, K) \tag{1}$$

where L and K are, respectively, the quanties of labour and capital and Y is the level of output. Now do the same thing assuming that the production function is Cobb-Douglas. How will your results change if you put the Cobb-Douglas function in logarithmic form?

2. Suppose in the above case that the price of output is P. Calculate the value marginal products of labour and capital and set them equal to the constant wage and rental rates, W and R.

3. Suppose we have a demand curve

$$Q_d = \alpha - \beta P \tag{2}$$

and supply curve

$$Q_s = \delta + \gamma P \tag{3}$$

Solve for the equilibrium price and quantity.

4. Suppose that the level of output can be expressed as

$$Y = mK\left[1 - \frac{1}{3\lambda}\left(\phi - \lambda\frac{L}{K}\right)^3\right]. \tag{4}$$

Obtain from this equation the demand function for money.

5.Calculate the innner-product and outer-product of the two vectors

$$\mathbf{a} = \begin{bmatrix} a_1 \\ a_2 \\ a_3 \\ a_4 \end{bmatrix} \quad \text{and} \quad \mathbf{b} = \begin{bmatrix} b_1 \\ b_2 \\ b_3 \\ b_4 \end{bmatrix}$$

.

6. Are either of the following two matrixes singular?

$$\begin{bmatrix} 5 & 3 & 7 \\ 6 & 2 & 2 \\ 8 & 1 & 3 \end{bmatrix} \quad \text{and} \quad \begin{bmatrix} 4 & 2 & 2 \\ 6 & 2 & 3 \\ 8 & 4 & 4 \end{bmatrix}$$

Basic Economics Review

1. What is the relationship between the ouput flow from a country's capital stock and the real interest rate?

2. What determines the price level in a closed economy? What causes inflation?

3. Explain the meaning of and difference between GDP and GNP. What is the role played by depreciation? Does increased saving necessarily result in an increase in the growth rate of the domestic economy?

4. Explain the gains from international trade using an analysis of its effects on the rents to producers and consumers within a supply and demand framework. Then analyse the gains from trade using production possibilities and indifference curves for both trading countries. Does free trade necessarily lead to an increase in social welfare?

5. What determines the level of unemployment? What is the effect on it of unexpected qnd expected increases in the money supply? What effect does a change in the money supply have on domestic interest rates?

6. Will the imposition of rent controls in a modern economy bring about a reduction of poverty?

7. Will the imposition of a minimum wage improve the incomes of the poorest workers in an economy?

8. Will the imposition of farm price supports improve the incomes of current and future poor farmers?

Basic Statistics Review

1. Describe the available measures of central tendency and dispersion of economic variables.

2. Consider the hypothesis that Canadian real GDP moves through time in exact step with that of the U.S.— i.e., they move identically. To test this proposition use the data in the file **causqdat.xls** to calculate the year-over-year growth (quarterly) of Canadian and U.S real GDP, and the excess of Canadian over U.S. GDP growth. Then calculate mean and variance of the growth difference and the standard deviation of the mean. How many standard deviations is the observed mean difference in growth from zero? What can you conclude on the basis of this evidence?

3. As an extension of question 1, calculate the median, first and second quartiles, range and inter-quartile range of the growth-of-real-GDP difference. What do these results tell you?

4. Now take a more detailed approach and regress the logarithm of the Canadian real GDP variable on the logarithm of the U.S. one and check whether the coefficient differs from unity. By how many standard deviations does it differ? Judging from the R-Square, what does this regression tell you in addition to your conclusion in 2. above? What can you additionally conclude by adding the price of crude oil relative to the prices of U.S. traded goods to your regression. Then add the Bank of Canada determined Canadian overnight rate, and then the year-over-year growths of the two countries M1 and M2 variables. What can you conclude? [Note that you can do all the above statistical analysis in Gnumeric by working off the tools menue item.]