Department of Economics
Queen's University

Econ320: Macroeconomic Theory II

Instructor: Khazri Afifa

Tutorial 2

Long Question

1. Consider an economy with technological but without population growth that is on its balanced growth path. Now suppose there is a one-time jump in the number of workers.

(a) At the time of the jump, does output per unit of effective labor rise, fall, or stay the same? Why?

(b) After the initial change (if any) in output per unit of effective labor when the new workers appear, is there any further change in output per unit of effective labor? If so, does it rise or fall? Why?

(c) Once the economy has again reached a balanced growth path, is output per unit of effective labor higher, lower, or the same as it was before the new workers appeared? Why?

2. Suppose the production function in the Solow model is given by the Cobb - Douglas form:

$$Y = K^{\alpha}(AL)^{1-\alpha}$$

Where Y is the real output, K is the capital stock and L is labor. Growth rate of labor is given by n, growth rate of technology is g.

(a) Find the steady-state value of capital per effective labor.

(b) Find the growth rate of output and consumption. Do they differ from the growth rate of output per worker and consumption per worker?

(c) Show how growth accounting could be used to learn the value of g.

(d) Analyze the effects of a permanent reduction in g on the real wage rate and the real interest rate.

(e) Suppose the government taxes all income at the rate τ, so that disposable income per effective worker is now $(1-\tau)y$ and saving is now the proportion s of disposable income. What are the new steady-state values of capital and consumption per effective labor?

3. Consider how unemployment would affect the Solow growth model. Suppose that output is produced according to the production function

$$Y = K^{\alpha}[(1-\mu)L]^{1-\alpha}$$

Where K is capital, L is the labor force, and μ is the natural rate of unemployment. The national saving rate is s, the labor force grows at rate n, and capital depreciates at rate δ.

(a) Express output per worker ($y = Y/L$) as a function of capital per worker ($k = K/L$) and the natural rate of unemployment.

(b) Suppose that some change in government policy reduces the natural rate of unemployment. Describe how this change affects output both immediately and over time. Is the steady-state effect on output larger or smaller that the immediate effect? Explain.

4. Consider the impact of an increase in thriftiness in the Keynesian cross. Suppose the consumption is:

$$C = \overline{C} + c(Y - T),$$

where $\overline{C}$ is a parameter called *autonomous consumption* and c is the marginal propensity to consume.

a. What happens to equilibrium income when the society becomes more thrifty, as represented by a decline in $\overline{C}$

b. What happens to equilibrium saving?

c. Why do you suppose this result is called the *paradox of thrift*?