Fall 2023
ECON 2152A (001)

Suggested Solutions to Practice Problems (Chapter 05)

1. In a one period model, taxes must be exactly equal to government spending. A reduction in taxes is therefore equivalent to a reduction in government spending. This result is exactly the opposite of the case of an increase in government spending presented in the textbook. A reduction in government spending induces a pure income effect that induces the consumer to consume more and work less. At lower employment, the equilibrium real wage is higher because the marginal product of labour rises when employment falls. Output falls, consumption rises, employment falls, and the real wage rises.

2. **A reduction in the capital stock.**

   a) This works exactly the same as for the increase in total factor productivity in Figures 5.8 and 5.9 in the text, except in reverse, that is, the PPF shifts down. Output falls, employment may rise or fall (because of offsetting income and substitution effects), leisure may rise or fall (likewise), consumption falls, and the real wage falls.

   b) Shocks to the capital stock qualitatively could replicate key business cycle facts, provided that the substitution effect on labour supply dominates. However, for Canada over the last 50 years, for example, the kinds of natural disasters or other capital-stock-destroying events that have occurred have typically had very small effects on the aggregate capital stock. This is not to say that such large disasters are impossible, or could not happen in the future.

5. **Production-enhancing aspects of government spending**.

   a) The increase in government spending in this example has two separate effects on the production possibilities frontier. First, the increase in government spending from G_1 to G_2 implies a parallel downward shift in the production possibilities frontier. Second, the productive nature of government spending is equivalent
   to an increase in total factor productivity that shifts the production possibilities frontier upward and increases its slope. Figure 5.3 draws the original production possibilities frontier as PPF_1 and the new production possibilities frontier as PPF_2. If the production-enhancing aspects of the increase in government spending are large enough, representative consumer utility could rise, as in Figure 5.3.

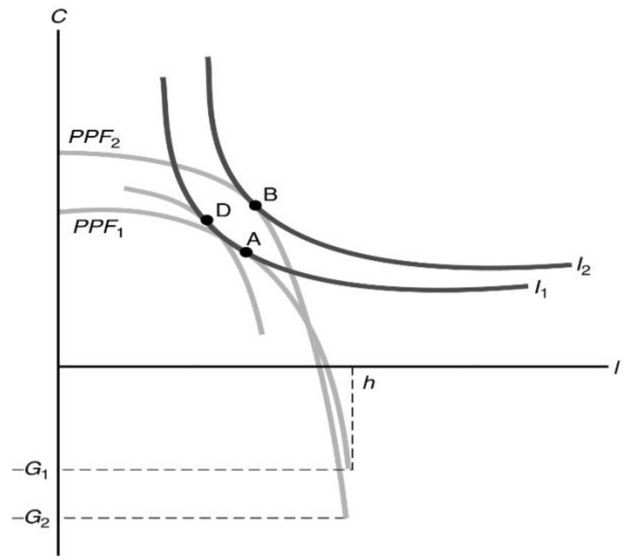

Figure 5.3

b) There are three effects at work in this example. First, there is a negative income effect from the increase in taxes needed to pay for the increased government spending. This effect tends to lower both consumption and leisure. Second, there is a substitution effect due to the productive effect of the increase in *G,* which is drawn as the movement from point A to point D. This effect tends to increase consumption and decrease leisure. Third, there is a positive income effect from the increase in *G* on productivity. This effect tends to increase both consumption and leisure. In Figure 5.3, the movement from point D to point B is the net effect of the two income effects. In general, consumption may rise or fall, and leisure may rise or fall. The overall effect on output is the same as in any increase in total factor productivity. Output surely rises.