INTERMEDIATE MACROECONOMICS
1. Exam 11.12.2014
Matti Koivuranta

1. Determine whether following statements are true or false. Right answer is worth 0.5 points and wrong answer costs 0.5 points. The total points cannot be negative however. There is a single right answer to each item.

    1. Current account is by definition equal to net exports.
    2. There is no significant correlation between investments and gross domestic product at business cycle frequencies.
    3. Ricardian equivalence does not hold if there is proportional taxation of labor income.
    4. Productivity growth does not affect growth of the economy in the Solow model.
    5. First fundamental welfare theorem states that general equilibrium allocation is Pareto efficient under certain conditions.
    6. Gross domestic product is a flow variable
    7. The government purchases of national income accounts include e.g. defense costs, costs of public education and unemployment benefits.
    8. Inflation means growth rate of price level.
    9. Gross national product of Finland includes profits from a plant which is located in China but owned by a Finnish firm.
    10. According to Fisher equation there is an approximate relation $R = r - i$ between nominal interest rate R, real interest rate r and inflation rate i.
    11. Unemployment rate means the ratio of unemployed people to working age population.
    12. Production function $F(K, N) = K^{0.3}N^{0.7}$ has constant returns to scale.

2. Assume the following Solow growth model. Savings rate is s from which it follows that investments I and consumption C are

$$\begin{aligned} I &= sY \\ C &= (1-s)Y, \end{aligned}$$

where Y is production. Production function is of Cobb-Douglas form:

$$Y = K^{\theta} N^{1-\theta}.$$

In above equation K is capital stock which has law of motion

$$K' = (1-d)K + I,$$

where d is the depreciation rate. Second argument of production function is labor force N. Labor force grows with rate n:

$$N' = (1+n)N.$$

Parameters have following restrictions:

$$\begin{aligned} &0 < s < 1 \\ &0 < \theta < 1 \\ &0 < d < 1 \\ &n \geq 0. \end{aligned}$$

a) Derive the law of motion for capital per capita (K/N).

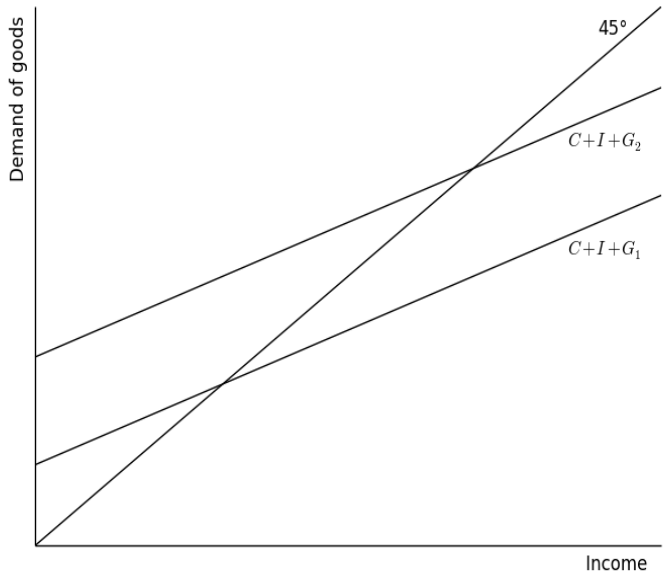
b) Show that capital per capita (K/N) has a strictly positive steady state which is stable.

c) What does golden rule mean within the Solow model?

3. a) What does neutrality of money mean?

   b) What does Ricardian equivalence mean?

4. In discussions about the government expenditure multiplier it is sometimes suggested based on figure below that the government expenditure multiplier is greater than unity. In the figure government purchases in-



   crease from G_1 to G_2, and the total demand curve shifts up by exactly amount $G_2 - G_1$.

   a) What does government expenditure multiplier mean and why is it greater that unity in the figure?

   b) What mechanisms inherent in general equilibrium have been omitted from the figure and how do the omissions affect conclusions about the magnitude of multiplier?

5. Compare general equilibrium macro models that are based on classical principles to Keynesian macro models. In particular tell what are the important differences in basic assumptions and how the effects of monetary and fiscal policy differ across the models.