INTERMEDIATE MACROECONOMICS
3. Exam 19.2.2015
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. Gross domestic product is a flow variable.
    2. There is no significant correlation between investments and gross domestic product at business cycle frequencies.
    3. First fundamental welfare theorem states that general equilibrium allocation is Pareto efficient under certain conditions.
    4. Central banks typically use changes of reserve requirements in their day-to-day control of the money supply.
    5. Gross national product of Finland includes profits from a plant which is located in China but owned by a Finnish firm.
    6. A good is an inferior good if the substitution effect dominates the income effect.
    7. In general equilibrium macro models fiscal policy has no effect on the economy.
    8. Unemployment rate means the ratio of unemployed people to working age population.
    9. Production function $F(K, N) = K^{0.3}N^{0.6}$ has constant returns to scale.
    10. The government purchases of national income accounts include e.g. defense costs, costs of public education and unemployment benefits.
    11. Current account is by definition equal to net exports.
    12. According to Fisher equation there is an approximate relation $r \approx R - i$ between nominal interest rate R, real interest rate r and inflation rate i.

2. Assume a household utility function $U(c, c')$ which depends on current consumption c and future consumption c'. Utility function has the usual properties, e.g. it is increasing in both arguments and has decreasing marginal utilities. The periodic budget constraints of the household are

$$\begin{aligned} c + s &= y \\ c' &= (1+r)s + y', \end{aligned}$$

where s is savings, r is real interest rate, y is current income and y' is future income.

   a) What is the lifetime budget constraint of the household?

   b) Draw the lifetime budget constraint of the household and some indifference curves.

   c) Analyze graphically how an increase in real interest rate r affects savings of a household which is initially a lender.

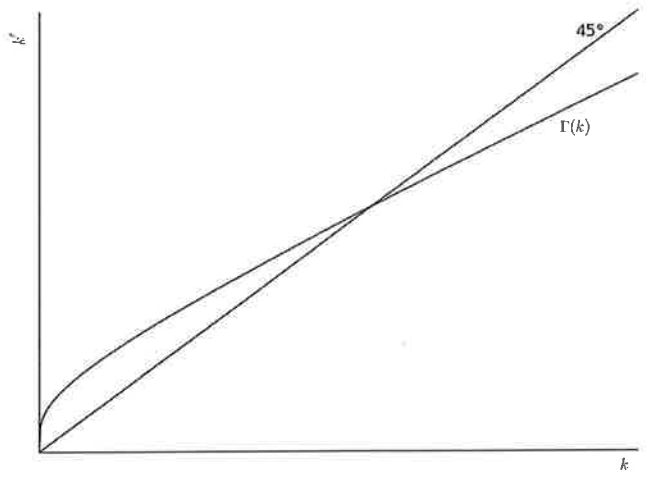
3. a) What does Ricardian equivalence mean?

   b) What assumptions are needed for Ricardian equivalence to hold and how realistic do you find these assumptions?

4. Assumptions of the basic Solow model imply law of motion of capital

$$k' = \frac{szf(k)}{1+n} + \frac{(1-d)k}{1+n}$$

where k' is future capital per capita, k is current capital per capita, s is savings rate, z is total factor productivity, n is population growth rate and f is production function in per capita form. Following figure, where $\Gamma(k)$ denotes the right hand side of the law of motion, describes the dynamics of capital per capita. Assume that economy is initially



in steady state and at given point of time savings rate s increases permanently.

a) Show graphically how steady state of capital per capita changes.

b) Sketch the trajectory of capital per capita (i.e. draw a figure with time on x-axis).

c) How is the long-run growth rate of the economy affected by the increase of s?

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.