

TOBB-ETU, Economics Department
Advanced Macroeconomics (IKT 496)
2016/17 Spring - Homework 3

You are allowed (and advised) to do the homework in a group of 2 people, but not more. You may hand in one copy of the solutions for the group. Late submissions will not be accepted. If you do not submit a homework, you will get 0, but cheating will be punished with 0

Multiple Choice Questions (0.3 points each. 1.5 points in total)

1-) (Economic Theories) Which of the following is true?

- a-) Both Classical and Keynesian theories use market imperfections in the form of price rigidities
- b-) What Classical and Keynesian theories share in common is that economic fluctuations can be caused by aggregate demand shocks
- c-) Keynesian economics rests on the Say's Law, which says that when an economy produces a certain level of real GDP, it also generates the income needed to purchase that level of real GDP
- d-) Both Keynesian and Monetary Economists recommended the use of Monetary tools in the era of Great Depression as a way of escaping from it
- e-) Classical economists tend to accept a distinction between nominal and real sectors

2-) (Economic Theories) Which of the following is false?

- a-) Lucas criticized earlier economic models on the basis of their use of aggregate macroeconomic variables in their models. He claimed that relationships between such variables may differ over time depending on what macroeconomic policy regime is in place
- b-) Lucas suggested that we have enough evidence from past data so that we are fairly sure that an increase in money supply lowers unemployment as it did before
- c-) The models that address Lucas Critique and use microfounded models together with Rational Expectation assumption are New-Keynesian and New-Classical Models
- d-) Lucas offered the use of Microeconomic foundations to underpin Macroeconomic theory so that the models would not be affected by policy changes.
- e-) The theory of rational expectations says that if there are no market imperfections, the actual data will deviate from the expectation only if there is an 'information shock', which is an information that is unforeseeable at the time expectations were formed

3-) (Economic Theories) Which of the following is true?

a-) New-Keynesian Models use sticky prices so that only some firms are able to adjust their prices (even if they all want to), which ensures a barrier in the front of the self-adjusting mechanism of the markets of the economy

b-) Real Business Cycle (RBC) models explain economic fluctuations by aggregate demand shocks

c-) What makes it hard to build an economic model that has a good fit to data is that in the last decades the data for macroeconomic variables started to be more volatile than before

d-) For RBC models we can seek for the solution of social planner problem but cannot use competitive markets

e-) New-Keynesian models are used to build on competitive markets just like RBC models are

4-) (Economics Theories) Which of the following is false?

a-) With detrending -but not with filtering- we can obtain fluctuations in particular frequencies in the data (Business Cycles)

b-) We can use detrending methods on the Real GDP to obtain output gap

c-) We use detrending and filtering methods to separate short term movements of the variables from their growth components

d-) A good economic model is the one that matches as much characteristics of the real data as possible (such as correlation among variables, autocorrelation and variance of each variable)

e-) We use impulse responses from models to see how the variables of the model react to a change in the stochastic component of the model (for instance to a change in the technological process)

5-) (Economics Theories) Which of the following is false about the RBC theory?

a-) It assumes that money is neutral even in the short run

b-) The unemployment in the economy is either voluntary, or exists due to artificial barriers such as minimum wage laws

c-) Economic fluctuations are optimal responses of variables (output, employment, and others) to technology (productivity) shocks.

d-) The cyclical characteristics of the data generated from the basic RBC models may not match all of the cyclical properties of the real data

e-) Early RBC theory uses demand shocks to explain economic fluctuations

Problem 1 (A RBC Model) (1.5 points)

We define an economy where the utility of a representative consumer

$$\max E\left[\sum_{t=1}^{\infty} \beta^t \left(\frac{C_t^{1-\theta} - 1}{1-\theta} + a(1 - N_t)\right)\right]$$

is subject to the resource constraint

$$C_t + K_t = Y_t + (1 - \delta)K_{t-1}$$

which uses production function

$$Y_t = Z_t K_{t-1}^\rho N_t^{1-\rho}$$

where there is exogenous process for technology: $\log Z_t = (1 - \psi) \log \bar{Z} + \psi \log Z_{t-1} + \epsilon_t$

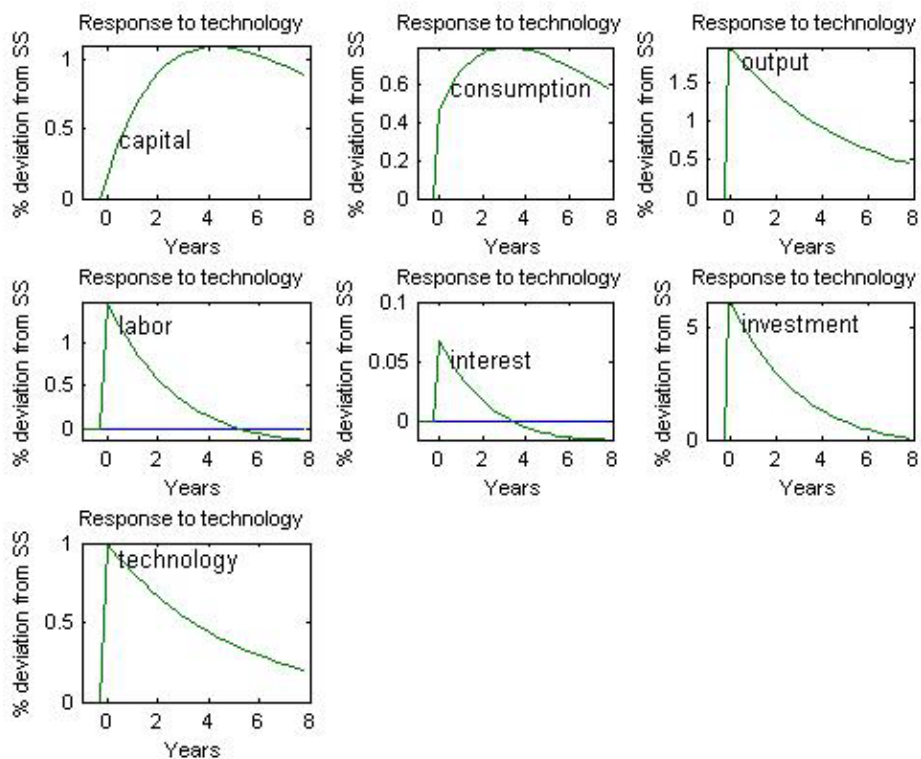
a-) Solve the social planner's problem and find the equilibrium conditions of the economy

b-) Find the steady state values of capital, investment, output, consumption $(\bar{K}, \bar{I}, \bar{Y}, \bar{C})$, and also the parameter in utility function for leisure (a) given that the steady state value of technological process is 1 ($\bar{Z} = 1$), the capital share in the production is 0.36, steady state employment is a third of total time endowment ($\bar{N} = 1/3$), depreciation rate for capital is 0.025, the long term average of the real interest per quarter (gross) is 1.01, and the coefficient of relative risk aversion $\theta = 0.5$

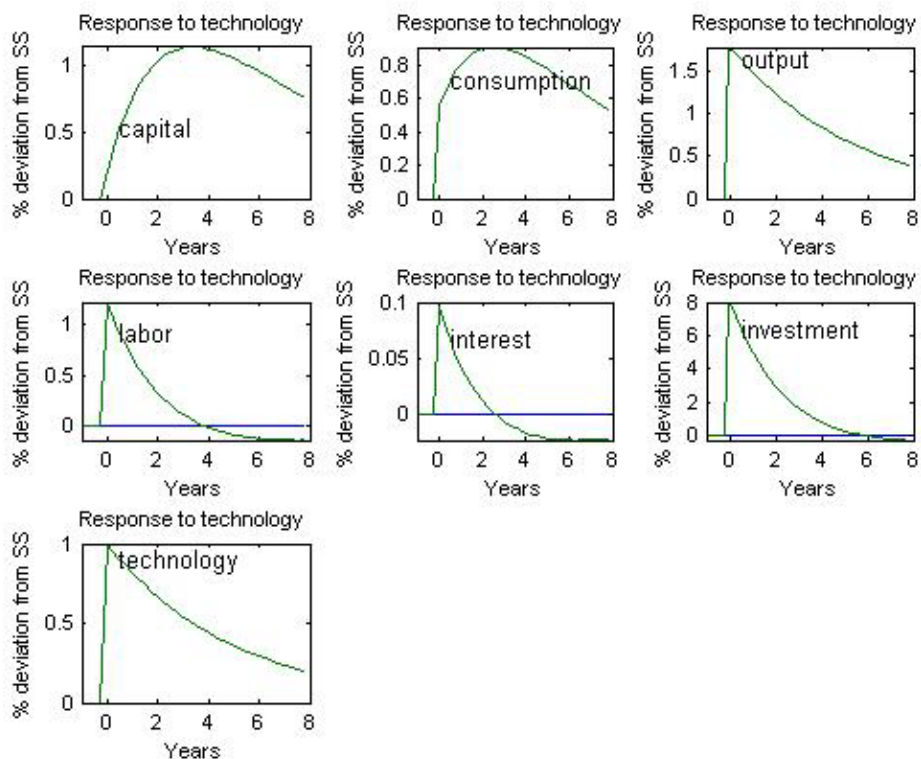
c-) Now assume that there is another country, characteristics of which is summarized just like the one above with the difference that the long term average of the real interest per quarter (gross) R is 1.05. Find the steady states of $(\bar{K}, \bar{I}, \bar{Y}, \bar{C})$ for this country and give an economic interpretation to the difference between countries

d-) The next two figures shows impulse responses of the variables of each above mentioned economies to a technological shock (impulse responses are the percentage changes in the variables in response to one percent technological shock). Do you see any difference between the countries? Explain it.

The Economy with $R = 1.01$



The Economy with $R = 1.05$



Problem 2 (Search and Matching Model) (1 point)

Recall the three equations (Beveridge Curve, Job Creation Condition and Wage Condition) for the equilibrium conditions of the Search and Matching Model

$$BC : u = \frac{\lambda}{\lambda + \theta q(\theta)} \quad JC : p - w = \frac{(r + \lambda)pc}{q(\theta)} \quad WC : w = (1 - \beta)z + \beta p(1 + c\theta)$$

Analyze the effect of an increase in worker's bargaining power (from β' to β'') graphically on w , u , v . Also given an economic interpretation when you move the lines and curves