Macroeconomic Theory II (1412)

A simple dynamic model (backward looking) IS-LM model

Instructor: Petros Varthalitis

TA: Nikos Yfantis

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Scan the QR code to visit the MT2 GitHub repository

Exercise 1 Assume the following closed economy, total demand is given by:

$$D_t = C_t + I_t + G_t$$

The ad-hoc behavioural equations for private consumption and investment are given by:

$$C_t = \bar{C} + c(Y_{t-1} - T_{t-1})$$

and

$$I_t = \bar{I} + \alpha Y_{t-1} - b i_{t-1}$$

In your solution assume the following parameterization $\bar{C} = 0.6$,$\bar{I} = 0.2$,$c = 0.5$, $\alpha = 0.1$, $b = 0.1$. Also assume that the fiscal authority follows a balanced budget

$$G_t = T_t = 1.7$$

while the monetary authority sets the nominal interest rate

$$i_t = 0.04$$

Solve for the steady state. Create a matlab function that find the steady state solution of this model (i.e., drop t).

Exercise 2 Assume that the closed economy starts off the steady state equilibrium, i.e., the initial value of output is:

$$Y_{-1} = 0.9Y^s$$

where Y^s denotes the steady state output which is computed in exercise 1.

1. Create a matlab function that computes the dynamic equilibrium transition from Y_{-1} towards the steady state output, Y^s. (**Create a vector with the time path of the endogenous variables of the model.**)

2. Plot in a single plot three subplots with the dynamic path of the endogenous variables of the model.

3. Repeat the above for an economy with $c = 0.4$ and $c = 0.7$.
4. Present in the same plot the dynamic transition of each economy, i.e., for $c = [0.4, 0.5, 0.6]$

Exercise 3 The economy starts at steady state given by ex. 1. Suppose the following macroeconomic policy changes which take place in the first period (one at a time).

1. The fiscal authority increases government expenditures by 50%.
2. The fiscal authority increases taxes by 30%.
3. The monetary authority increases nominal interest rate by 100bps.

For each of the macroeconomic policy changes:

- Compute the new steady state (show the new equilibrium in a graph along with the old one).
- Compute the transitional dynamics of the endogenous variables of the model.
- Suppose that employment is a fraction of output $L_t = \gamma Y_t$. Compute the transitional dynamics of employment, set $\gamma = 0.7$.