ISCTE — INSTITUTO UNIVERSITÁRIO DE LISBOA

Master in Economics

MACROECONOMICS

Problem sets: The New Keynesian Model

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Problem 1 – Simulating the New Keynesian Model (NKM) Model

The fundamental objective of this exercise is to get students on the computer and be able to simulate the basic NKM that was discussed in classes. Remember: we do not expect students to be able by now to write down a Matlab routine in order to put the computer running the model. This is the first macro course at the postgraduate level. So, we provide the Matlab routines that can perform that task. The files for this task can be found in the folder

NKM_Simulation.zip

In order to be able to go ahead with the simulation, you should notice the following.

1. Firstly, open and run the routine "Baseline_NK_Model.m" written down by Zeno Enders (University of Bonn). This routine gives you the possibility of choosing just one shock (a technological or supply side shock, or a monetary or demand side shock), or both shocks together. You have to choose your option and click in one of the buttons that will be opened within Matlab when you start running this routine. I would advise you to choose both shocks, otherwise the model will give too little persistence compared to what we find in data from a real economy.

   (a) This routine will provide you with the impulse response functions of various variables of the model.

   (b) The numerical data will be automatically save in the file "resp.mat", which can be found in the "Workspace" window.

2. Then you should open and run the routine "correlation.m" written by myself, which will provide you with figures covering the correlation and cross-correlation of three variables: *Inflation = resp(:, 3); Output = resp(:, 5); Interest = resp(:, 9).*

3. If you choose the two shocks simultaneously, the columns in the "resp.mat" file represent the following

1	2	9	5	4	3	8	7	6
nu	i	i_r	y	y_g	pi	i_n	y_n	h

   (a) a is the technological shock, i represents the nominal interest rate, i_r is the real interest rate, y for real output, y_g for output gap, pi is the inflation rate, i_n for the natural level of the interest rate, y_n is the natural output, h stands for hours of work, and nu is the monetary shock.

4. From the previous steps you should choose what you consider more relevant to exercise number two. But notice that most of those information items will be relevant to exercise number two.

Problem 2 – Comparing the NKM model with the stylized facts from business cycles

In the previous exercise, you ran the NKM model and you got some numerical information about the model's output. Now you are required to compare that output with what you did (or supposed to have done) in the first assignment, in which you collected data for the US economy and obtained the major characteristics of its business cycles.

In particular, it is expected that you should be able to compare the model's output with the output from the US economy with respect to these items:

1. Volatility
2. Procyclical and countercyclical behavior
3. Persistence (you may have doubts with respect to persistence, but here I can help).