TOPICS IN MACROECONOMICS: MODELLING INFORMATION, LEARNING AND EXPECTATIONS

HOMEWORK 2 FALL 2009

Answer all questions using MatLab. Write up your answers and how they were derived and submit in pdf form together with supporting m-files by Thursday the 10th of December to knimark@crei.cat. Where possible, please use notation established in lecture notes.

Question 1 The Social Value of Public Information

Use Equation (17) in Morris and Shin (2002) to plot the following graphs:

a) x-axis:Precision of private signal $\beta \in (0.01, 1)$, y-axis: expected welfare (at θ). Use $\alpha = 1$ and $r = 0.8$

b) x-axis:Precision of private signal $\beta \in (0.01, 1)$, y-axis: expected welfare (at θ). Use $\alpha = 1$ and $r = 0.3$

c) x-axis: Precision of public signal $\alpha \in (0.01, 1)$, y-axis: expected welfare (at θ). Use $\beta = 1$ and $r = 0.8$

d) x-axis: Precision of public signal $\alpha \in (0.01, 1)$, y-axis: expected welfare (at θ). Use $\beta = 1$ and $r = 0.3$

Relate results to L.E.O Svensson (2006) comment on Morris and Shin's paper.

Question 2 Learning and Bounded Rationality

Consider the Cob-Web model

$$\begin{aligned} p_t &= \mu + \alpha E_{t-1} p_t + \delta w_{t-1} + \eta_t \\ w_t &= \rho w_{t-1} + u_t \end{aligned}$$

The REE of the Cob-Web model is given by

$$p_t = \frac{\mu}{1-\alpha} + \frac{\delta}{1-\alpha} w_{t-1} + \eta_{t-1} \quad (REE)$$

a) Simulate the cob web model for 100 periods under recursive least squares/decreasing gain learning when agents fit a perceived law of motion that nests the REE. Use the parameter values $\mu = 1, \alpha = 0.5, \delta = .7$, $\rho = 0.5$. Report the evolution of the price level p_t and the evolution of the parameters (including the chosen starting values) in the perceived law of motion of agents.

b) Simulate the cob web model for 100 periods under constant gain learning when agents fit a perceived law of motion that nests the REE. Discuss differences between decreasing and constant gain learning.

c) Simulate the cob web model for 100 periods under recursive least squares/decreasing gain learning when agents fit the perceived law of motion

$$p_t = a_{t-1} + e_t \quad (PLM)$$

d) Redo 2 a) with $\alpha = 1.5$. Discuss.