Problem Set 6: Real Business Cycle Model

Real Business Cycle Theory

Exercise 1. Suppose a government decides to raise tax rates permanently. However, it *phases* in the new policy over a number of years. What are the economic effects of this for labour supply?

Exercise 2. Empirically, *quits* from jobs fall in recessions. Is this observation consistent with RBC theory?

Exercise 3. Write down the labour/leisure optimality condition in the RBC model. Over time, wage and consumption grow at approximately the same rate. What does the RBC model predict for the long-run trend in labour hours?

Exercise 4. Does RBC theory take the view that recessions are desirable?

Exercise 5. Suppose the Irish government raises marginal tax rates on wages *temporarily* in the budget. Explain clearly the implications of this policy would within the context of the RBC model.

Exercise 6. According to RBC theory, if the government was attempting to stabilize labour input over the business cycle, how should it levy taxes on wage income?

Exercise 7. Suppose that, because of budget deficits, the government systematically raises labour taxes in a recession, but lowers them in a boom. What are the implications for labour supply?

Exercise 8. Explain why, the more transitory the shock, the greater the increase in the investment/gdp ratio, when A rises.

Exercise 9. Suppose in a two period RBC model, utility takes the form

$$\log c_1 + \log c_2 - \gamma l_1 - \gamma l_2$$

while the lifetime budget constraint is $c_1 + c_2 = A_1 l_1 + A_2 l_2$. If $A_1 > A_2$, determine l_2. Use intuition only, and explain answer. Would your answer be the same if utility took the form $\log c_1 + \log c_2 - \gamma l_1^3 - \gamma l_2^3$. Explain.

Exercise 10. Suppose the utility function in the RBC model takes the form

$$u(C) = \log C$$

Assume agents may work 12 hours per day. What would labour supply be in equilibrium? Explain how the dynamics of the model would change if there was a temporary, but persistent TFP shock.

Exercise 11. Explain what would happen to i) output ii) consumption and iii) labour supply if there was a temporary increase in A for one period, and the production function was $Y = AL$? Assume output is non-storable.

Exercise 12. If shocks to A were not persistent, would investment still rise if A rose in a given period?

Exercise 13. What would happen if consumers expected a once-off positive TFP shock *next period*? What implications would there be for the economy *this* period?

Exercise 14. If there was temporary but persistent increase in A, what would happen to the rental rate on capital over time.

Exercise 15. What happens if there was a *once-off* 1% increase in the capital stock in a given period?

Exercise 16. What happens to labour supply in period 1 if there is a *permanent* rise in productivity?