

June 2017

Macro 1 PhD Qualifier

PART A (40%):

Answer one of the following questions:

1. Suppose there are M symmetric sectors indexed by $i \in (0, 1)$ and each sector produces a differentiated good. Let $w_i = W_i/P$ and $p_i = P_i/P$. The production function in sector i is: $Y_i = L_i$. The demand for output is: $Y_i = p_i^{-\eta} A/M$ where A is the aggregate demand. Firm i maximizes real profit: $R = p_i Y_i - w_i L_i$. Also assume that the labor union in sector i maximizes the utility of the representative worker: $U_i = w_i L_i - \phi L_i^\gamma / \gamma$. Assume that the decisions variables for the unions and firms are w_i and p_i , respectively, rather than their nominal counterparts.
 - a. Derive the wage- and price-setting schedules.
 - b. Find equilibrium employment and real wage.
 - c. How does the equilibrium employment under imperfect competition differ from what would have prevailed under perfect competition? What roles do parameters η and γ play in explaining involuntary unemployment? Explain your answer.
 - d. What is the role of the “real wage rigidity” in the new-Keynesian model and its relevance in this model?

2. Suppose that the central bank loss function is: $\min L = (Y_1 - Y^*)^2 + \beta(\pi_2 - \pi^T)^2$. The Phillips curve is: $\pi_1 = \pi_0 + \alpha(Y_0 - Y^*)$. The IS equation is: $Y_1 - Y^* = -a(r_0 - r^s)$. $\beta > 0, \alpha > 0, a > 0$.
 - a. Derive the optimal monetary policy rule.
 - b. Describe the lag structure of this model and derive the interest rate rule.
 - c. Suppose the economy is initially at the potential level of output Y^* and the target inflation rate. At time 0 there is a temporary (one-period) positive investment shock. Describe the impact on the economy and the response of the central bank in periods 1, 2, and 3. Illustrate your answer with the IS, PC, and MR diagrams.
 - d. “Relative weights on output and inflation in the interest rate rule indicate the central bank’s preferences for reducing inflation as compared to output deviations.” Do you agree? Discuss.

PART B (40%):

Answer one of the following questions:

1. Write an essay to compare and contrast the 3-equation, RBC-DSGE, and the new neo-classical synthesis models. Your essay should address the questions of:
 - a. Expectations formation;
 - b. Propagations mechanisms that drive the business cycles;
 - c. The response of inflation to output gaps;
 - d. The response of inflation to the labor market
 - e. Unemployment and underemployment
2. Explain and illustrate how a monetary expansion affects real output under the standard Keynesian, Friedman (1968), new-Keynesian (monopolistic competition), and Lucas models.

PART C (20%):

Answer one of the following questions:

1. “Two institutional developments that may dampen the business cycles in the context of the “Keynesian” model are increased access of households to credit and the emergence of forward-looking central banks.” Discuss.
2. Consider an economy in which the labor productivity increases with the real wage [i.e. $Q=F(e(w)L)$ where $F(\cdot)$ is the production function, $e(\cdot)$ is the effort function, w is real wage, L is quantity of labor and Q is output]. Assume that productivity increases initially at an increasing and then at a diminishing rate. Demonstrate that at the profit maximizing real wage: the effort elasticity will be unitary, there will be involuntary unemployment, and if effort is a direct function of unemployment, then an adverse demand shock reduces the efficiency wage. (You do not need to answer these algebraically. Graphical demonstration with explanation is sufficient.)

ECON 7008 Macro 2 Qualifier Spring 2017. RvA.

1. **Essay: NAIRU & stagnation, 34pts.** Some heterodox analyses of the interaction between inflation and economic activity concur with “mainstream” results that a continuous and invariant set of policy options does not exist. Critically discuss differences and similarities in light of recent debates on the possibility of *secular stagnation*.
2. **Goodwin with induced technical change, 33pts:** Briefly sketch Goodwin’s 67 model of cyclical growth. Now assume that labor productivity growth is not constant, but proportional to the labor share: $a = \alpha\psi$. Analyze the system, sketch a phase diagram, briefly discuss.
3. **Kaldorian dynamics, 33pts:** Present the models of Kaldor (1940) and Skott (1989). Critically discuss key features and strengths and weaknesses.