

AMERICAN UNIVERSITY
Department of Economics

Comprehensive Examination
Preliminary Theory

June 2009
Page 1 of 2

SPECIAL MACROECONOMICS SECTION

Instructions: Answer all three questions, 1, 2, and 3. In # 1, there is some choice (to answer two out of the three parts). You have a half hour (30 mins.) to read and plan your answers and two (2) hours to write your answers.

1. Answer any two (2) of the following three parts (a)-(b)-(c):

(a) Why does neoclassical growth theory predict economic convergence? Is it necessary to postulate increasing returns in order to explain divergence?

(b) Discuss the two key predictions of the rational expectations permanent income hypothesis (RE-PIH) model of consumption. Provide intuition for the results. Do you find empirical support for the RE-PIH?

(c) Define Ricardian equivalence and discuss the policy significance. Under what conditions might the hypothesis fail to hold?

2. Consider the following q-theory model of investment:

$$\begin{bmatrix} \dot{q} \\ \dot{K} \end{bmatrix} = \begin{bmatrix} r & -(1-\tau)F''(K^*) \\ K/\psi & 0 \end{bmatrix} \begin{bmatrix} q - q^* \\ K - K^* \end{bmatrix}$$

where q is the price of investment goods and K the stock of capital. Assume the derivatives of the production function are such that $F' > 0$ and $F'' < 0$.

(a) Draw the phase diagram for this model. Discuss whether the above system is saddlepath stable.

(b) Analyze the effects of a temporary tax increase, using the phase diagram, and show the time plots of q and K .

(c) Does this particular fiscal policy affect long run investment, capital, and output?

(d) Why do you think q overshoots its long run equilibrium value during the transition to long run equilibrium?

(The exam continues on the next page)

3. Consider the following classical model:

$$(1) Y = F(K, N) = 10\sqrt{KN}, \quad \text{where } K = 1$$

$$(2) \frac{W}{P} = F_N(K, N)$$

$$(3) N = N\left(\frac{W}{P}\right) = 25\frac{W}{P}$$

$$(4) Y = C + I + G$$

$$(5) C = C(Y - T), \quad C' > 0$$

$$(6) I = I(r), \quad I' < 0$$

$$(7) \frac{M}{P} = L(r, Y), \quad L_r < 0 \text{ and } L_Y > 0$$

where Y denotes output, K capital, N labor, W nominal wage, P price level, C consumption, I investment, G government spending, r interest rate, L money demand, T taxes, and M money supply. Equation (1) is the production function (aggregate supply), equation (2) the labor demand function, equation (3) labor supply function, equation (4) goods market clearing condition (output = spending), equation (5) the consumption function, (6) the investment function, and (7) the money market clearing condition (real money supply = money demand).

(i) Is the model recursive? Explain.

(ii) From the production function, derive F_N and the explicit labor demand function (i.e. desired N as a function of W/P).

(iii) Find the equilibrium N , Y , and W/P . Show the equilibrium in a labor market diagram, with the real wage on the vertical axis and N on the horizontal.

(iv) Derive the goods market clearing condition and the money market clearing condition, and totally differentiate them. Using your totally differentiated equations, write the model in matrix form (with the endogenous differentials (dp , dr) on the LHS and exogenous differentials on the RHS).

(v) Calculate the following comparative statics, $\frac{\partial r}{\partial G}$, $\frac{\partial p}{\partial G}$, using your model in (iv).

Based on the changes in r and p you derived, discuss how a rise in G (holding everything else constant) affects output Y , investment I , consumption C , money demand L , and the nominal wage W . Is fiscal policy effective here?

(End of exam)