Economics 503 Fall 1999
Problem Set II

The due date for this assignment is Tuesday, September 21, 1999 (in class).

1. Consider the following classical model:

$$\begin{aligned} y &= c[y(1-\tau), r] + i(r) + g && (1)\\ l(y,r) &= \frac{M}{P} && (2)\\ y &= F(N,K) && (3)\\ \frac{w}{P} &= F_N && (4)\\ N^S &= \phi(w/P,\tau) \qquad \phi_1 > 0, \phi_2 < 0 && (5)\\ N^S &= N^D && (6) \end{aligned}$$

where τ is the tax rate, and K is exogenous. All partial derivatives have the usual sign.

   (a) Use expressions 1 and 2 to derive an aggregate demand schedule. What is the effect of $d\tau$ and dg on the AD curve.

   (b) Use expressions 3, 4, 5 and 6 to derive an expression for dy. Hence show that the model is classical. What is the effect of $d\tau$ on y? What is the effect of dM on y and P? Can you interpret your answer in terms of an *IS-LM* diagram?

   (c) Use your results in parts a and b to determine the effects of $d\tau$ on P. Show that your analytical results are consistent with an *AD-AS* diagram. Show, with an *IS-LM* and *AD-AS* diagram that if $l_2 = 0$ that $\frac{dP}{d\tau}$ is surely positive.

2. This question concerns the neutrality of money in classical macroeconomic models. For the purposes of this question use the model of question 1. What is the effect of a change in the nominal money stock on the rate of interest in this version of the classical model? Suppose, however, that consumption depends not only on y and r, but also on real wealth (Pigou effect). Hence, replace equation 1 with:

$$y = c[y(1-\tau), r, \frac{M+B}{P}] + i(y,r) + g$$

where B is the stock of government bonds. Our concern is whether money is still neutral in this model. Specifically,

   (a) Show that $\frac{dr}{dM}$ is no longer equal to zero in this model, and provide an intuitive explanation of your result.

   (b) Find a change in assets that *is* neutral in this model (i.e., will leave dr unchanged). Explain the logic of your result. Given your results, how should the neutrality proposition be expressed in a classical model with Pigou effects?