797N – Macro 3
Fall 2015

Problem set 3

1. Consider an economy with a centralized trade union. The objective function of the union is given by

$$V^{union} = -a\pi^2 - b(y - y^*)^2$$

where the parameters a and b are non-negative, y and π denote (the logarithm of) the level of real output and the rate of inflation, and y^* is the union's preferred level of real output. The union chooses the rate of wage inflation, ω, and the monetary authorities control the growth rate of aggregate nominal demand, m (which by definition is equal to the sum of inflation and the growth of real output: $m = \pi + y - y_{-1}$). Employment and output are determined by profit maximizing firms which (assuming diminishing returns to labor) implies an inverse relation between changes in output and changes in the real wage,

$$y = y_{-1} + \lambda(\pi - \omega)$$

   (a) Set up the union's maximization problem and

      i. derive the response function (the value of ω as a function of the monetary authorities' choice of m and predetermined variables).

      ii. Use the response function to derive an expression for $\pi - \omega$ and show that
$$y = \frac{b}{a+b}y^* + \frac{a}{a+b}m + \frac{a}{a+b}y_{-1}$$

      iii. Show that if m is kept constant, $y_t \to y^* + \frac{a}{b}m$ and $\pi_t \to m$.

   (b) Discuss the main assumptions of the model and its implications for monetary policy and the existence of a "Phillips-curve tradeoff".

2. Consider a small open economy and assume that we have a "bargained real wage" (a generalized version of a Walrasian a labor supply curve) determined by

$$w/p_c = f(E), f\prime > 0$$

and a "price determined real wage" (derived from firms' first order condition and a generalized version of the labor demand curve) determined by

$$w/p = g(E), g\prime \leq 0$$

where E is employment and p is the domestic producer price. p_c is the consumer price index, which is given by

$$p_c = h(p, ep^*), h_1 > 0, h_2 > 0$$

where e and p^* denote the exchange rate and the price of foreign goods.

Do these equations determine a unique equilibrium rate of unemployment in the home economy? Does that mean that the NAIRU concept is irrelevant for a small open economy? (Explain!)